THE IRON AGE

New York, July 18, 1929

ESTABLISHED 1855 VOL. 124, No. 3

Quality of Heat Treating Improved

Increased Production in Same Floor Area and Reduction in Labor Costs Also Result from Electrification of Heat-Treating Department

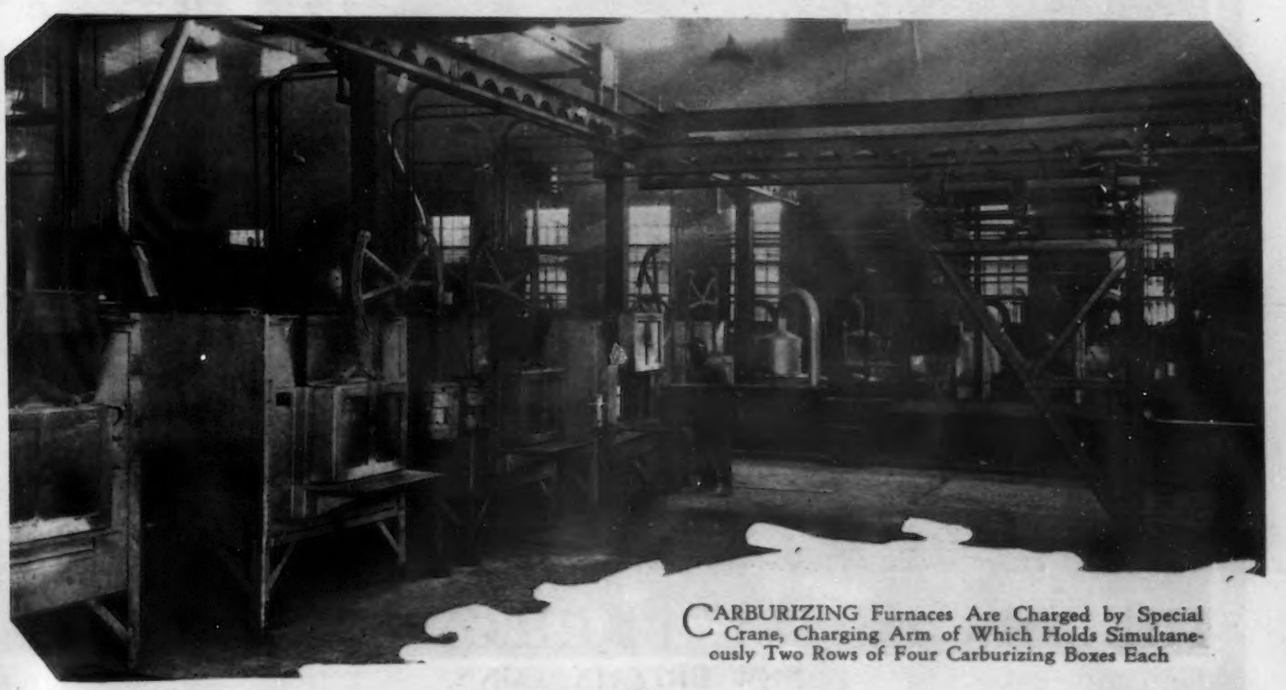
IMPROVEMENT in the quality of work, increased production in the same floor area formerly occupied, and elimination of a large amount of hand labor are major benefits derived from electrification of the heat-treating department of the National Cash Register Co., Dayton, Ohio, in which 6,000,000 cash register parts are heat treated each month. Conservation of manufacturing space has been accomplished by the installation of mechanical handling devices, an automatic transportation system now forming an integral part of the plan whereby material in process moves progressively through the department without any backtracking.

For carburizing purposes the department is equipped with five electric carburizing furnaces. Immediately behind them is a metal table on which carburizing boxes are loaded by hand. Connecting at right angles with the metal table and running alongside each furnace is a roller conveyor which carries filled boxes to a position near the front of the furnace. Here the boxes are picked up by a special charging crane, the charging arm of which holds simultaneously two rows of four boxes each. The arm then swings around and reaches into any of the five furnaces, depositing the eight boxes.

The time required for carburizing ranges from 3 to 7 hr. and the temperature varies from 1500 to 1650 deg. Fahr., both the time and the temperature depending upon the type of material being treated. Carburizing boxes are 12 in. long, 6 in. wide and 12 in. deep and are of larger capacity than formerly. However, the change in size has been accomplished by increasing the height without altering the thickness of the box; otherwise, the temperature of the furnace would have to be increased to bring about the desired results.

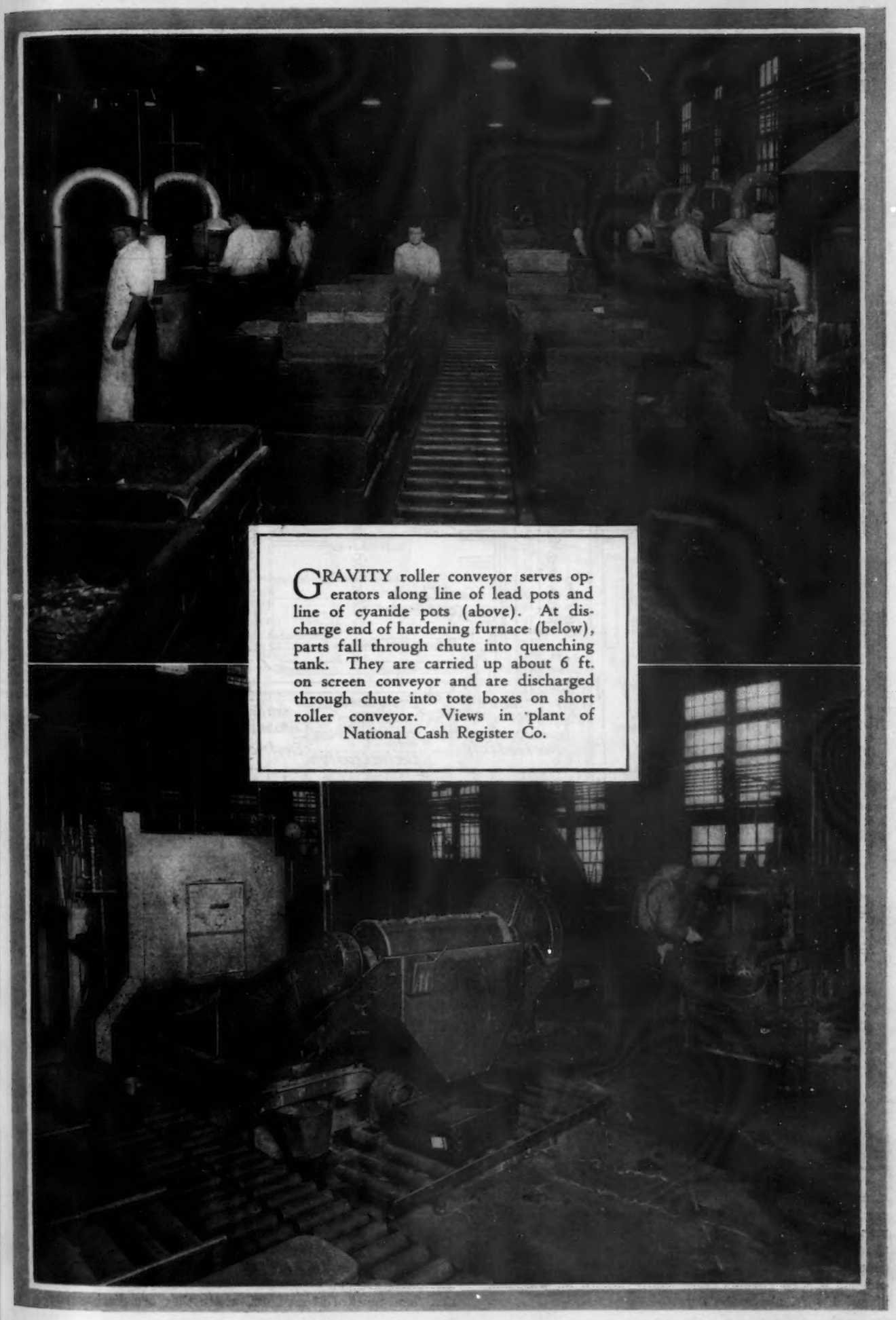
Carburizing Furnaces Are on 24-hr. Schedule

Carburizing furnaces are on a 24-hr. schedule, starting Monday morning and ending Saturday noon. The continuous operation provides a steady electrical power



CARBURIZING Furnaces Are Charged by Special Crane, Charging Arm of Which Holds Simultaneously Two Rows of Four Carburizing Boxes Each

IN the heat-treating department of the National Cash Register Co., Dayton, Ohio, carburizing boxes, after being removed from furnaces, are placed on cooling rolls (above). Continuous hardening furnace is shown in background. In the lower photograph operators are loading carburizing boxes by hand on metal platform immediately behind carburizing furnaces.

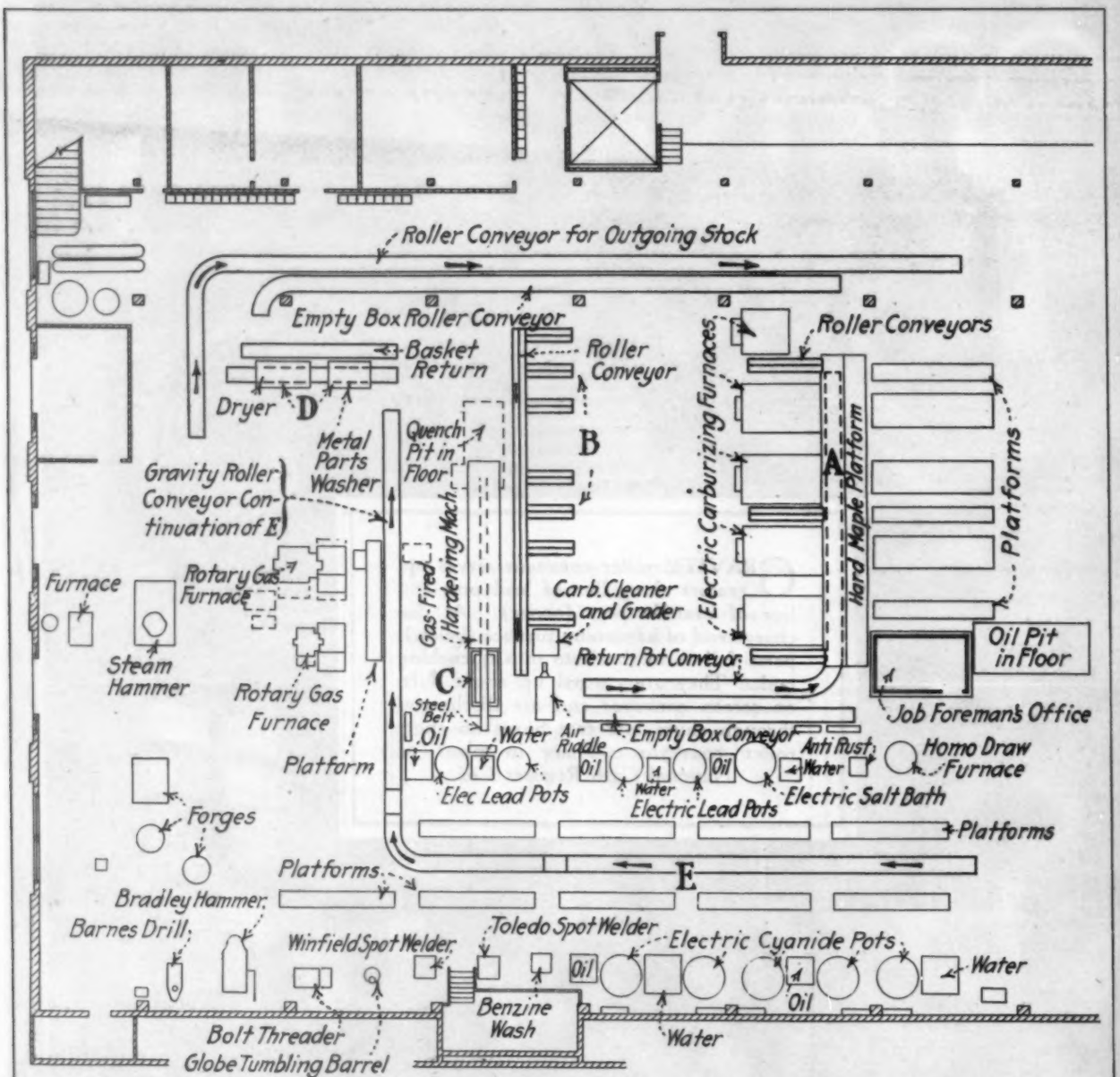


GRAVITY roller conveyor serves operators along line of lead pots and line of cyanide pots (above). At discharge end of hardening furnace (below), parts fall through chute into quenching tank. They are carried up about 6 ft. on screen conveyor and are discharged through chute into tote boxes on short roller conveyor. Views in plant of National Cash Register Co.

load and eliminates the necessity for cooling the furnaces at comparatively short intervals, thus adding substantially to the operating efficiency and to the output of the department.

At a distance of about 15 ft. from the front of the furnaces are unloading and cooling rolls, each roll having

When the boxes have cooled sufficiently, they are moved on a roller conveyor to the loading platform of a continuous hardening furnace, where the cash register parts are removed. The boxes, still on the roller conveyor, are returned to storage underneath the metal loading table behind the carburizing furnaces. The cash



PARTS to Be Heat Treated Are Loaded in Carburizing Boxes (A) and Are Moved to Front Side of Carburizing Furnaces on Roller Conveyors, Where They Are Picked Up by Charging Crane and Placed in Furnaces. After being heat treated, they are removed from furnaces by charging crane and are deposited on cooling rolls (B).

When sufficiently cooled, they go on roller conveyor to loading platform of continuous hardening furnace (C), where parts are removed and are fed by hand on to metal belt of continuous hardening furnace. Parts pass through furnace and thence through metal washing machine and drying oven (D), from which they are discharged into tote boxes.

After passing inspection, parts are transported on roller conveyor to storage position ready to go out of department.

For certain kinds of work, lead pots and cyanide pots are used. They are arranged so that gravity conveyor (E) runs between line of lead pots and line of cyanide pots, serving both.

a capacity of eight carburizing boxes. The charging crane removes the boxes from the furnaces in the same manner in which they were charged and deposits them on the cooling rolls, where they remain until they are cool enough to be handled by hand. Incidentally, each roll consists of two parallel roller conveyors 16 in. wide and placed 1½ ft. above the floor.

register parts are fed on to the metal belt of the continuous hardening furnace by a workman at the loading end of the furnace. At the discharge end the heat-treated parts fall through an air-tight chute into a quenching solution which fills a quenching tank built in the floor. The parts drop on to a metal screen conveyor which carries them upward about 6 ft., where they are discharged

through a chute into tote boxes resting on a short roller conveyor.

From this point the parts go through a washing machine for cleaning metals and thence through a drying oven from which they are discharged into tote boxes. When filled, the tote boxes are put on a roller conveyor, are carefully inspected and are transported to a storage position, where they are ready to be taken to the next department in the process of manufacture.

In connection with the continuous hardening furnace, the most difficult problem is timing the movement of the steel conveyor belt so that each different kind of part is properly hardened. Since there are thousands of various parts constantly passing through the department, close watch over the movement of the belt must be kept so as to assure readjustment of speed whenever necessary. The time required for passage of parts through the furnace ranges from 5 min. to 20 min., depending on the size of the part. The average temperature in the furnace is 1400 deg. Fahr.

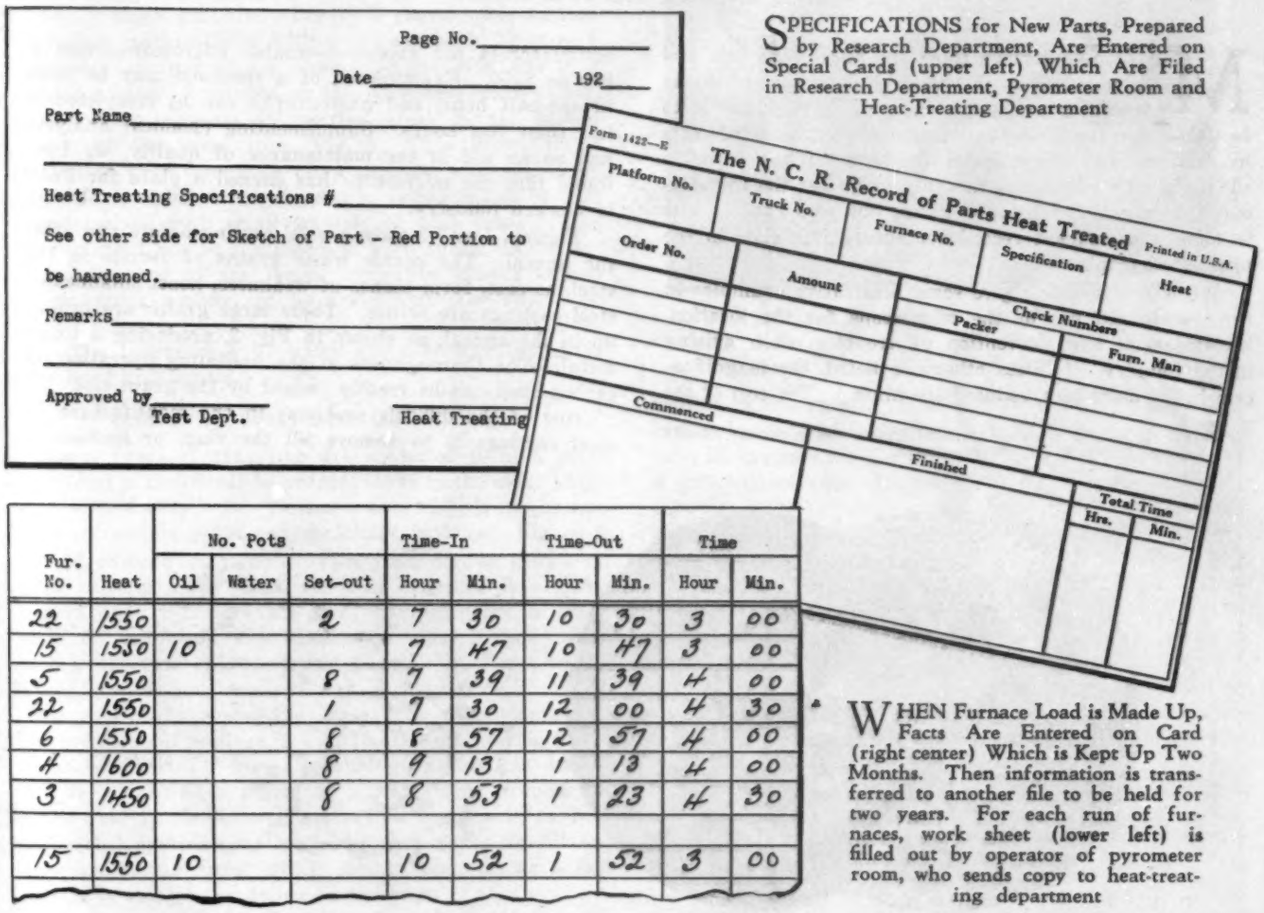
For certain kinds of work lead pots and cyanide pots are used. They are so arranged that a gravity conveyor runs between a line of lead pots and a line of cyanide pots, serving both. Parts, contained in tote boxes, move down this conveyor which, at the end of the line of pots, turns at right angles and leads to the metal cleaning machine.

On certain cash register parts localized carburizing and hardening is necessary. In such cases special acetylene carburizing and hardening machines are used for spot hardening.

Furnaces in the heat-treating department are under close pyrometer control. The pyrometers are located in a special balcony room at the east end of the department and are controlled by an operator who is employed by and is under the supervision of the research department.

Each tote box of cash register parts coming to the heat-treating department is accompanied by a stock card, which is delivered to the pyrometer room. The furnace loads are made up and specifications are assigned by the operator in charge of the pyrometer room.

In case a new part is to be heat treated, the pyrometer operator sends the stock card and a sample of the part to the research department, which prepares specifications for heat treatment and writes them on a special card for new parts. These cards are filed in the research department, in the pyrometer room, and in the heat-treating department according to the name and page number of the part.



Page No._____

Date_____ 192____

Part Name_____

_____

Heat Treating Specifications #_____

See other side for Sketch of Part - Red Portion to be hardened._____

Remarks_____

_____

Approved by_____ _____

Test Dept. Heat Treating

Form 1427—E

The N. C. R. Record of Parts Heat Treated

Printed in U.S.A.

Platform No.	Truck No.	Furnace No.	Specification	Heat

Order No.	Amount	Check Numbers: Packer	Check Numbers: Furn. Man

Commenced	Finished	Total Time: Hrs.	Total Time: Min.

Fur. No.	Heat	No. Pots: Oil	No. Pots: Water	No. Pots: Set-out	Time-In: Hour	Time-In: Min.	Time-Out: Hour	Time-Out: Min.	Time: Hour	Time: Min.
22	1550			2	7	30	10	30	3	00
15	1550	10			7	47	10	47	3	00
5	1550			8	7	39	11	39	4	00
22	1550			1	7	30	12	00	4	30
6	1550			8	8	57	12	57	4	00
4	1600			8	9	13	1	13	4	00
3	1450			8	8	53	1	23	4	30
15	1550	10			10	52	1	52	3	00

SPECIFICATIONS for New Parts, Prepared by Research Department, Are Entered on Special Cards (upper left) Which Are Filed in Research Department, Pyrometer Room and Heat-Treating Department

WHEN Furnace Load is Made Up, Facts Are Entered on Card (right center) Which is Kept Up Two Months. Then information is transferred to another file to be held for two years. For each run of furnaces, work sheet (lower left) is filled out by operator of pyrometer room, who sends copy to heat-treating department

When the operator of the pyrometer room receives stock cards of parts to be heat treated, he checks the specifications against the specifications for the same part contained in his files. This check serves as a guard against error.

When a load for a furnace is made up, facts are entered on a card which is called a "record of parts heat treated." Information includes the furnace number, specification, platform and truck number, order number, amount, identification of the packer and furnace man, the time the heat commenced and finished and the total time of heat treatment. This record is kept for two months, after which it is transferred to another file to be held for two years.

For each run of the furnaces a work sheet is made out by the operator of the pyrometer room, who sends a copy to the heat-treating department.

A yearly record of the operation of each furnace is filed for reference purposes on small cards giving the date and the number of parts heat treated. All pyrometer records are kept for two years so that facts regarding heat treatment of any part is at hand in case any question arises.

Trouble Shooting With Microscopes

Characteristic Microstructure Indicates Cause and Remedy for Many Common Troubles in Steel, Iron or Malleable Foundry

BY E. K. SMITH AND F. B. RIGGAN*

MANY foundrymen think the microscope is a tool for use only in the research department. From several years' experience, we have found it to be useful for the investigation and prevention of defects in castings and other metal products. When "trouble shooting," the microscope not only magnifies the foundryman's eyesight 100 to 1000 times, but also enables him to have a permanent record for future reference in the photomicrograph.

We will attempt to give some illustrative examples in this specialized use of the microscope for the location, investigation, and prevention of troubles often arising in the foundry. (Unless otherwise noted, the magnification is 100 diameters, reduced one-ninth.) The cost of the equipment is not excessive—usable microscopes cost as low as $250. Examination of a specimen may be made in one-half hour, and photographs can be completed in less than two hours. Supplementing chemical analysis, and as an aid in the maintenance of quality, we have found that the microscope has earned a place for itself in modern industry.

Figures 1 and 2 show a steel casting before and after the anneal. The coarse white grains of ferrite in the steel, as cast, form planes of weakness, hence unannealed steel castings are brittle. These large grains are broken up in the anneal, as shown in Fig. 2, producing a tough metal. The thoroughness of the annealing operation on carbon steel can be readily judged by the grain size.

One of the difficult problems in the manufacture of steel castings is to remove all the slag, or inclusions,

*Metallurgist and associate metallurgist, respectively, Stockham Pipe & Fittings Co., Birmingham.

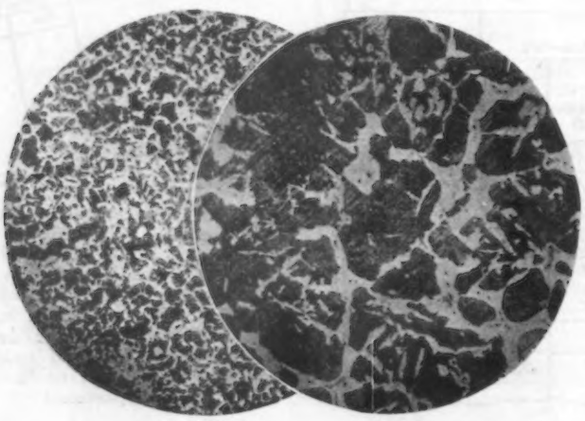


FIG. 1

FIG. 2

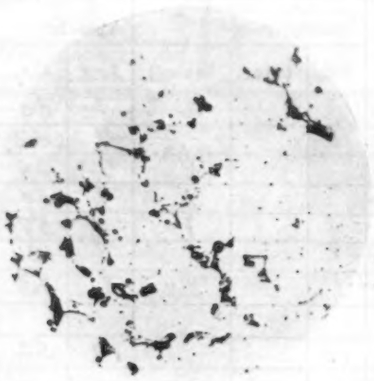


FIG. 3

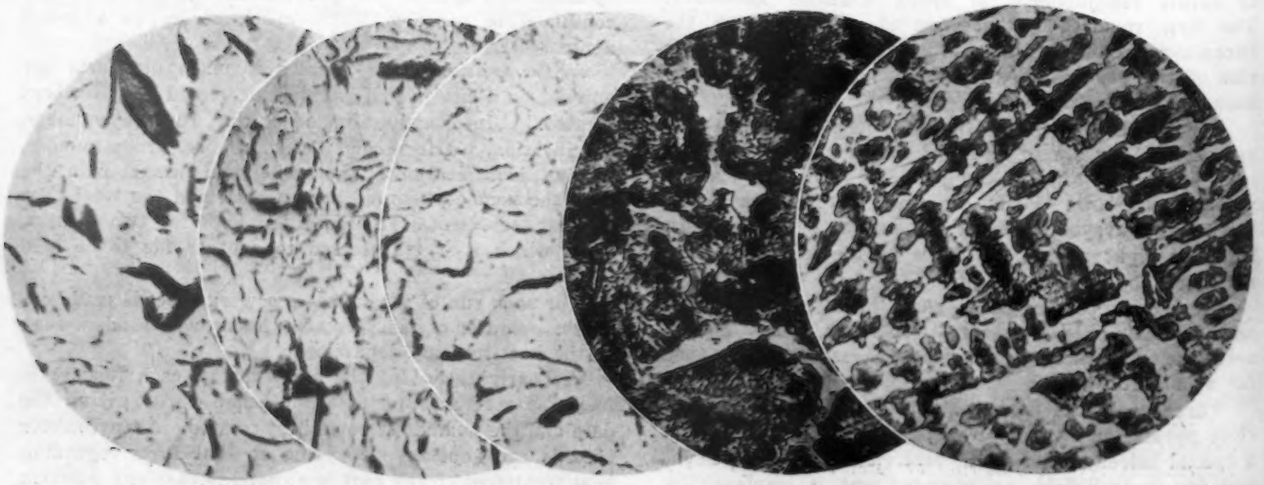


FIG. 4 FIG. 5 FIG. 6 FIG. 7 FIG. 8

incidental to the melting and refining processes. Examination of a polished sample, unetched will show such inclusions. Fig. 3 is an unrefined steel, containing large slag inclusions, indicating a very inferior metal. A clean electric steel would present an almost unblemished mirror, having only a light sprinkling of very small specks of non-metallics.

Micros 4 to 8 show cast irons of various degrees of machinability. Figures 4, 5, and 6 are unetched. The first of these is a gray iron with large flakes of graphite, which naturally causes planes of weakness. This iron is suitable only where ease of machining is more important than strength. The strength could be increased by lowering the carbon or silicon content, thus obtaining a finer grained graphite. Figure 5 shows such an iron combining machinability with great strength. Figure 6 illustrates an iron with still smaller graphite, due to a greater amount of carbon in the combined form. Combined carbon appears in mottled areas in the etched sample of the same iron, Fig. 7. This shows white patches of hard cementite (iron carbide) surrounded by striped or mottled areas of pearlite (small plates of iron carbide mixed with small crystals of pure iron). This casting could not be machined at high speed, unless annealed, because of the larger cementite masses caused by too quick cooling, or by excessively low silicon or carbon. Figure 8 is a very hard iron, almost unmachinable. The large areas of white are cementite, which is very hard and brittle.

Discovering Leaky Gray Iron Castings

Some types of gray iron are subjected to high pressures and it is difficult to prevent leaks in the older kinds of very soft gray iron. Leakage, as a rule, is due to two things: porous grain and shrinkage cavities. Figure 9 (X 500, reduced one-half) shows a weak, porous, gray iron, after etching. The black space is a drilled hole. The jagged part is where the drill has torn out a large plate of graphite. The microscope clearly shows why such a structure would not hold pressure, although, to the naked eye, the iron seems to have a close grain.

A view of a shrinkage cavity, X 1000, reduced one-half, (etched sample) is given in Fig. 10. Besides leaking under pressure, "shrinks" cause trouble in machining, due to the very hard edge shown as a white area around the black hole in the micrograph. The remedy is to feed the metal continuously while pouring so as to fill the cavities, to use metal which shrinks less, or, as a last resort, to change the design of the part.

The microscope has found an immediate place in the malleable foundry, since it is so well adapted for locating

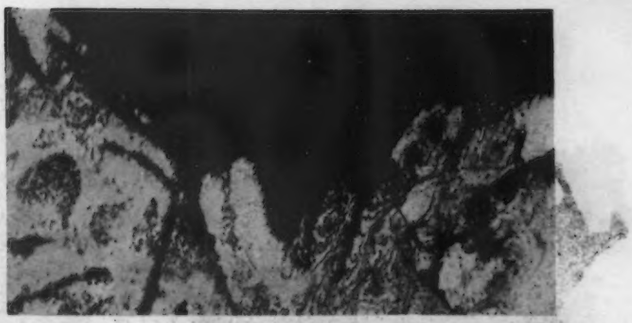


FIG. 9 (TOP) FIG. 10 (LOWER)

trouble in the anneal. Any difficulty due to composition can be located easily by chemical analysis; however, this tells us comparatively little about the heat treatment of a defective casting. Figure 11 shows the white iron, before the anneal (etched). The material is very hard and brittle, the structure being in a characteristic tree-like form called dendrites. If this hard iron had had even a very light anneal, some black spots of temper carbon would be seen, as in Fig. 12 (a partly annealed malleable). Spots of black temper carbon are surrounded by light rings of practically carbon-free iron (ferrite), but the general gray background shows that graphitization is not nearly complete. Figure 13 illustrates the structure of completely annealed malleable. The black spots are temper carbon, the light grains are ferrite.

Sometimes there is difficulty in machining malleable castings. If the microscope shows a "bull's-eye" structure, as in Fig. 12, the anneal was not sufficient for the composition of the metal. Sometimes the trouble is due to a hard edge, as shown in Fig. 14. This is usually traceable either to annealing conditions, or to faulty analysis.

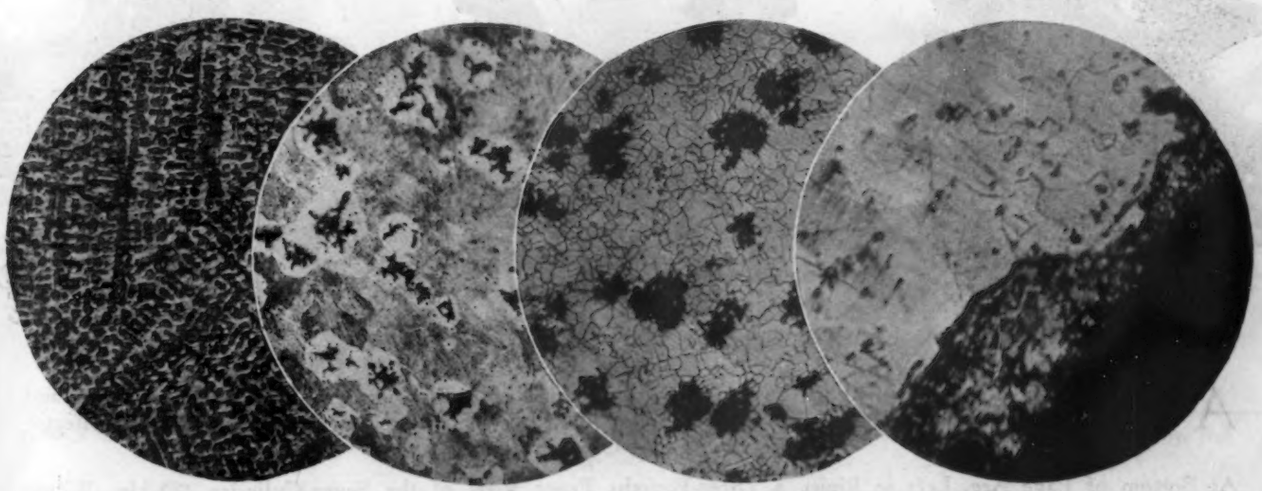
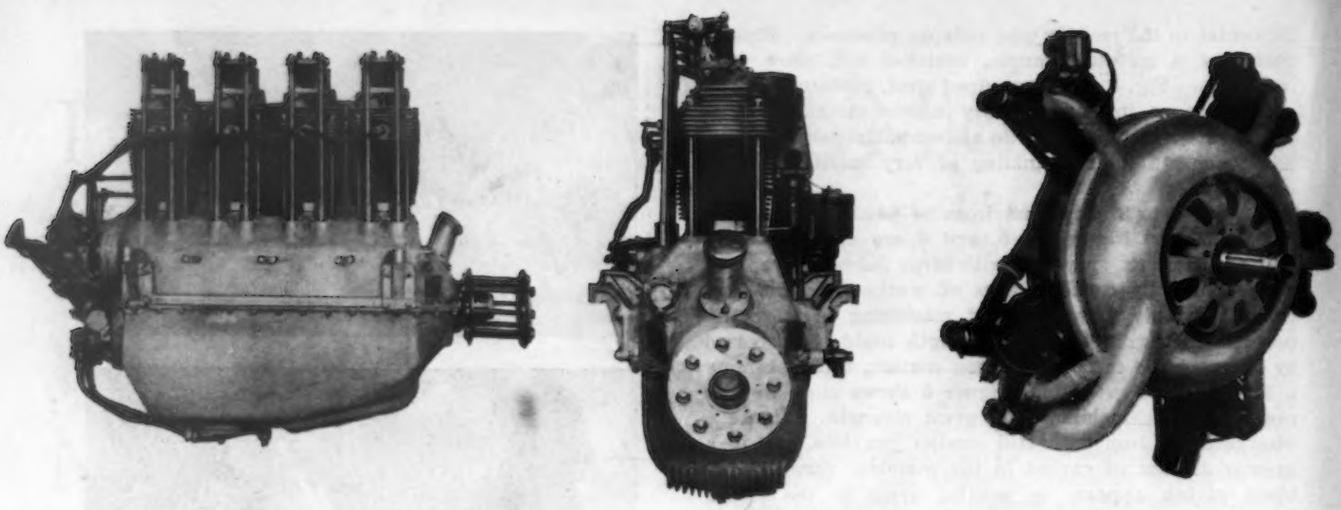


FIG. 11 FIG. 12 FIG. 13 FIG. 14



New Wright Aeronautical Engines

Three Units Have Many Parts Interchangeable— Manufacturing and Storing Problems Are Simplified

BY FAY LEONE FAUROTE

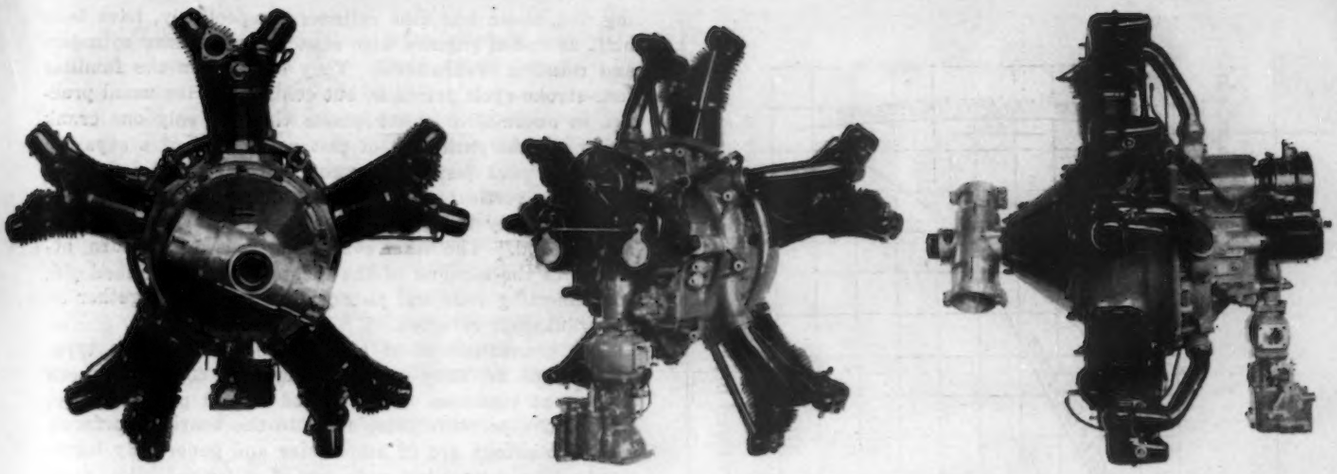
DURING the early part of 1928 there appeared in these pages a description of the Wright Whirlwind aeronautical engine, and its method of fabrication and assembly.* The property of the Wright Aeronautical Corporation then consisted of some seven acres of land. Manufacture was being carried on in a plant, part of which was rented, having an area of 125,000 sq. ft. There were some 1100 employees. The fixed assets amounted to about $2,100,000. The public's acceptance of flying as a safe means of transportation and the rapid growth of the aviation industry have, however, combined to produce an increase in aeronautical engine manufacture which hardly seemed possible a year ago.

At present there are more than 2600 employees on the company's payrolls; the corporation owns some 28 acres of land adjacent to the main line of the Erie Railroad in Paterson, N. J.; has over 600,000 sq. ft. of manufacturing and testing space; an enlarged plant equipped with modern machinery, much of it of special design, capable of producing 500 engines a month on one shift. The gross investment in fixed assets at the end of February, 1929, according to information given me by James P. Prince, treasurer, exceeded $7,600,000. The profit for the year

*See THE IRON AGE, Feb. 9, 1928, page 394; March 1, page 590; March 29, page 867. The present is the first installment in a series of articles dealing with the manufacture of the new Wright engines for aircraft.

AT Top of Page Are, Left to Right, the Gipsy 90-Hp. Engine of Four Cylinders, Side and End Views and a Three-Fourths Front View of the Five-Cylinder 165-Hp. Whirlwind Engine, with Exhaust Collector Ring and Nose Cowl in Place

At Bottom of Page Are, Left to Right, a Three-Fourths Front View of the Seven-Cylinder 225-Hp. Whirlwind Engine and Front and Side Views of the Nine-Cylinder 300-Hp. Unit



ended Dec. 31, 1928, amounted, after deduction of Federal taxes, to $2,433,771. Fifteen hundred and ten engines of the 225-hp. Whirlwind type constituted the bulk of the year's business. The company's sales in 1928 amounted to $8,781,516. This represented delivery of 1644 engines of various types, together with spare parts. Of these, 766 engines were sold to the United States Government, the remaining 878 to commercial manufacturers.

Following as a natural result of growth in aeronautical transportation, there has been a demand for a wider range of engine power. The Wright company has accordingly designed a new line of Whirlwind engines in five-, seven- and nine-cylinder sizes, developing 165, 225 and 300 hp. respectively. These new power plants are lighter than the earlier ones and contain several refinements and improvements in design which will make their description and method of fabrication of interest to all the readers of THE IRON AGE.

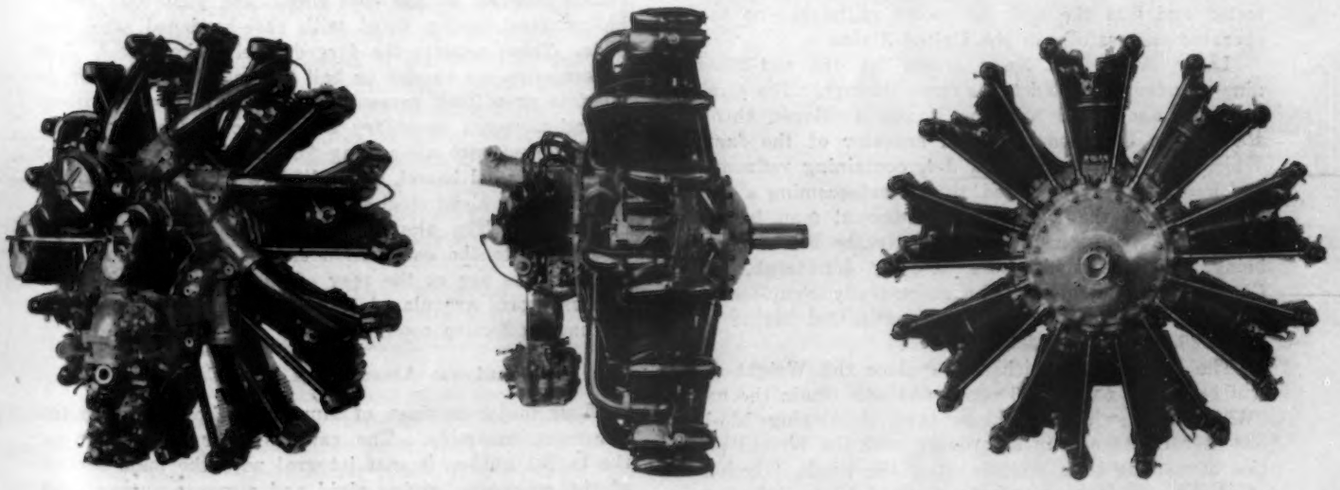
Of paramount importance is the fact that in these three new models there is a very complete interchangeability of parts, wherever possible. Furthermore, their manufacture, as now being carried on in the new Wright plant, is the first good example of the application of mass production methods to very close limits that I have seen in the airplane engine field. The new engines are now going into quantity production and about 25 a day are coming through. The ratio of production of the three types at present is 400 of the nine-cylinder 300 hp. (Model R-975), 50 of the seven-cylinder 225 hp. (Model R-760), and 50 of the five-cylinder 165 hp. unit (Model R-540).

In addition to this, the engineers have developed in the experimental department an inverted V-type, 500-hp. air-cooled engine which promises much. According to Charles L. Lawrance, president of the company, this engine has successfully passed its 50-hr. official test, and an experimental contract for 14 of these engines has been placed by the United States Government. Mr. Lawrance says further that this type of engine will, it is believed, in a measure supersede the large radial air-cooled engines for heavy transport service, due to its greatly reduced head resistance for equivalent horsepower. While this engine has not been flight-tested, and no adequate performance data are yet available, it is said that the representatives of the Government have confidence in it as a type for observation and bombing planes.

Arrangements have also been made with the de Haviland Aircraft Co., London, England, for the manufacturing and selling rights in the United States of the 90 to 100-hp. four-cylinder air-cooled Gipsy engine. It is expected that this engine will go into production during the summer. The Wright line of aeronautical engines will then comprise five models ranging from 100 to 525 hp.

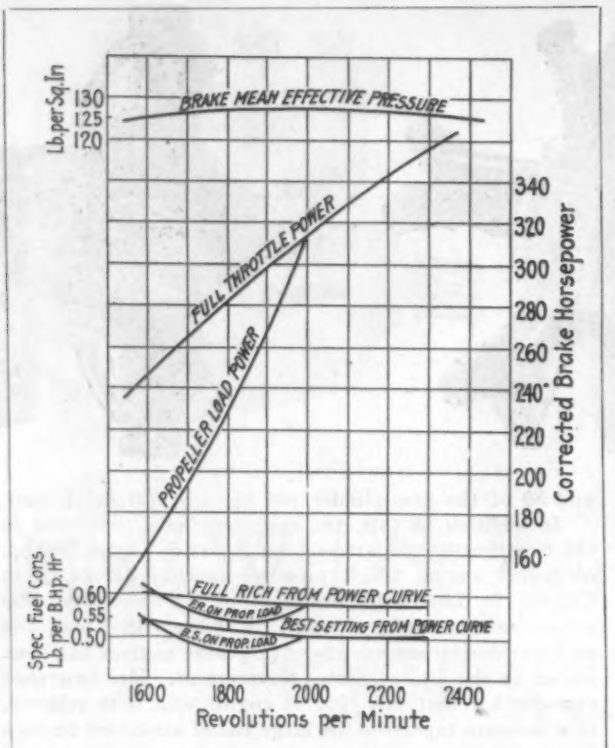
Development of the Lawrance Engine

As early as 1914 Charles L. Lawrance attempted to demonstrate the value of the air-cooled aeronautical engine, building two-cylinder and three-cylinder types on



AT Top of Page Are, Left to Right, Front, Three-Fourths Rear and Side Views of the Five-Cylinder 165-Hp. Whirlwind Engine. Exhaust collector rings and nose cowls are not in place, but two views show the propeller hub

At Bottom of Page Are, Left to Right, a Rear View of the Nine-Cylinder 300-Hp. Whirlwind Engine and Side and Front Views of the Still Larger Cyclone Engine, Also with Nine Cylinders, but Developing 525 Hp.



WRIGHT Whirlwind Model R-975, 9-Cylinder Aircraft Engine, Power Curves at Full Throttle and on Propeller Load; Fuel Consumption at Full Rich and Best Setting; Compression Ratio 5.1 to 1, Using Aviation Gasoline

an experimental scale. Unfortunately, he was unable to bring his ideas to fruition during the World War, but both the English engineers and the American aviation authorities, realizing the value of the light weight and the simplicity of the air-cooled type, became interested. In 1923, through a merger effected between the Lawrance Aero Engine Corporation and the Wright company, all rights to the manufacture and sale of the Lawrance air-cooled engines were obtained; and finally, after a successful test, the Army gave the Wright company an order for a 350-hp. engine which was known in the shop as Model R-1. This was successfully designed, built and tested and was the first air-cooled radial engine to be operated successfully in the United States.

Later, Army and Navy orders for 150 and 200-hp. nine-cylinder air-cooled types came through. The smaller one was abandoned and the larger developed through stages into the Model J-1, an ancestor of the famous Whirlwind. Models J-3 and J-4, containing refinements and improvements, followed, the latter becoming a favorite with both the Navy and commercial manufacturers for planes requiring 200-hp. Finally the J-5 came into being, and this model was used by Lindbergh, Byrd, Chamberlain and others who successfully completed the amazing trans-oceanic and trans-continental flights during 1926, 1927 and 1928.

The new series which will replace the Wright J-5's will be known as the J-6 series and will retain the name "Whirlwind"; while the large type, developing 525-hp., has been christened, in accordance with the Wright practice of naming their engines after the winds, "Cyclone."

Three New Wright Whirlwinds

BELIEVING that it would be a great advantage if most of the major parts could be standardized and made interchangeable, the three new Wright Whirlwinds, having five, seven and nine cylinders respectively, have been built as radial engines with standard stationary cylinders and rotating crankshafts. They operate on the familiar four-stroke cycle principle, but contrary to the usual practice in automotive power plants there is only one crank throw for the entire set of pistons, instead of a separate throw for each piston. The connecting rod from the piston in the vertical cylinder is the only connecting rod attached directly to the crankshaft. This is known as the "master rod." The other connecting rods are, in turn, attached to the big end of the master rod by a linked pin, all connecting rods and pistons thus working together as the crankshaft revolves.

The crankshaft is of a single-throw two-piece type, made from an alloy-steel forging and counterbalanced to prevent vibration. It is drilled for oil passages, giving positive-pressure lubrication to the bearing surfaces. All the bearings are of ample size and generously lubricated. The connecting rods are of a forged alloy steel and consist of the one-piece master rod and the articulated rods, one for each cylinder. The wrist-pin and knuckle-pin bushings are of bronze, pressed into the articulated rods. The crankpin bearing is of anti-friction metal, steel backed, pressed and doweled into the big end of the master rod.

By a unique design it is possible in these models to do away with the two-piece master rod with its cap, formerly used in Wright Whirlwind engines, and to use in its place a one-piece rod cut out of a solid forging, which when the crankshaft is disassembled may be slid on from the open end of the crank.

Aluminum-Alloy Pistons Used

The pistons are made of aluminum-alloy, cross-ribbed on the under side of the head, and fitted with full-floating hollow pins held in place by expanding spring wire locks, so that the ends of the pins are prevented from destroying the cylinder walls. The piston pins and cylinder walls are lubricated by oil spray from the crank and knuckle-pin bearings. The upper external surface of the piston head is slightly concave, which in conjunction with the internal shape of the cylinder head results in an almost ideal spherical combustion chamber.

The whole valve mechanism, including push-rods, is completely inclosed as a protection against dust, salt-spray and the like, the rocker shafts being mounted in a housing cast integrally with the cylinder head. Hardened steel cam followers operate through hardened steel rollers running on the cam ring. The push-rods are of hollow steel tubing fitted with case-hardened steel ball ends. These actuate the forged steel rocker arms. The rocker arms are carried on ball bearings lubricated by an Alemite or a Zerk pressure system and have provisions for adjustments necessary for correct valve clearances.

Equipped with air-cooling fins carefully machined out of a solid steel barrel, the cylinders are attached to the crankcase by eight steel studs passing through the cylinder flange. The aluminum alloy head is screwed and shrunk on to the combustion end of the cylinder. The intake ports are at the rear of the cylinders, while the exhaust ports are placed on the forward side, to obtain the most effective cooling.

Crankcase Assembly of Four Castings

Four major castings of aluminum alloy make up the crankcase assembly. The cam follower ring, carrying the tappet guides, is cast integral with the main section of the crankcase, giving rigid and accurate support and perfect lubrication to the shafts, and resulting in a considerable saving in weight and in the elimination of a number of detailed parts. The rear section carries all accessory drives, such as those for magnetos, oil and fuel pumps, generator and rotary induction system. Pro-

vision is made also for the easy installation of a suitable generator and starter. The whole crankcase unit is strong, compact and light in weight.

All accessories on the engine are at the rear, including the valve-operating push-rods. By this arrangement the head resistance of the engine while in flight is reduced and simple, effective cowling design is possible. Accessories such as the magneto, etc., are protected also. Each engine is provided with a front exhaust manifold of the collector-ring type and with a nose cowling with shutters operated from the pilot's seat. These movable shutters permit the flow of air around the crankcase and cylinders to be regulated so as to give the maximum engine efficiency under varying climatic conditions and atmospheric temperatures.

Provision for Lubrication

Lubrication is provided by a pressure pump which carries the oil to the front or rear of the hollow crankshaft, from which point it is distributed to the various bearings of the equipment. The excess oil from all parts of the engine drains into a sump located in the main crankshaft casting, between the bottom cylinders. From this sump a single-suction pump delivers the oil to the main oil tank in the airplane, passing it through a strainer installed at a convenient point outside the engine. This strainer removes any foreign material that may have found its way into the lubricating system. The oil pressure is automatically regulated by an adjustable valve. The lubrication system has been carefully designed so as to eliminate all external oil pipes. Experience has shown that external oil pipes are liable to leakage and they have proved to be unsatisfactory in service, due to the excessive cooling of the oil in cold weather. By this new design troubles arising from these sources have been ended.

Magnetos and Carbureter Are in Rear

Two Scintilla magnetos, mounted behind the engine and operating independently, provide the ignition through two separate spark plugs in each cylinder. While both of these magnetos are normally in simultaneous use, the engine will operate in an emergency on one magneto, with a slight loss of speed.

A specially designed Stromberg carbureter of the single-barrel type, mounted on the rear section of the crankcase, supplies the fuel mixture. Passing through the carbureter into the diffuser chamber of the crankcase, the mixture is evenly distributed through all cylinders by a unique rotary impeller mounted in this diffuser chamber. This system of positive control of the distribution of the mixture produces a smoothly running engine and is of special value in the smaller types, eliminating the vibration caused by unequal distribution of the combustible mixture. A "hot spot" which thoroughly vaporizes the fuel mixture is provided above the carbureter. The temperature may be regulated by the pilot so that maximum efficiency and fuel economy may be obtained under all kinds of conditions.

The same type and diameter of mounting ring is used for all three of the new Wright Whirlwinds. All controls are placed at the rear of the engine, thus simplifying the installation.

Aside from the crankcase and other connective parts which are manifestly not interchangeable between the three models, all of the other parts, such as the cylinder, cylinder heads, valves, rocker arms, push-rods, pistons, piston pins and the like, are wholly interchangeable. This is proving to be a great advantage and will simplify greatly the maintenance and service problems, both on the field and in the shop.

Each engine is shipped complete with the following items: carbureter, air heater and cleaner, nose cowling, exhaust manifold, ignition switch, priming pump, tool kit, instruction book and domestic shipping box.

Extra accessories for all models, not included in the table, include Eclipse hand inertia starter, weighing 21 lb. approximately; Eclipse generator, 15-volt, 15-amp., 16 lb.; Eclipse generater control box, 2½ lb.; Fuel pump (Wright C-3 modified), 2 lb.; Standard steel propeller hub, 23 lb.

Engine Specifications

Type—Air cooled, four cycle, fixed radial			
Model No.	R-540	R-760	R-975
Number of cylinders	5	7	9
Bore	5 in.	5 in.	5 in.
Stroke	5½ in.	5½ in.	5½ in.
Displacement	540 cu. in.	756 cu. in.	975 cu. in.
Compression ratio	5.1:1	5.1:1	5.1:1
Guaranteed horsepower (sea level) at 2000 r.p.m.	165	225	300
Fuel consumption (maximum), per hphr.	0.55 lb.	0.55 lb.	0.55 lb.
Oil consumption (maximum), per hphr.	0.035 lb.	0.035 lb.	0.035 lb.
Length overall (no starter)	40⅝ in.	40⅜ in.	41⅞ in.
Mounting flange to propeller hub	28⅜ in.	28⅜ in.	28⅜ in.
Diameter overall	45 in.	45 in.	45 in.
WEIGHTS, EQUIPMENT AND ACCESSORIES			
Engine (including hot-spot)	370 lb.	425 lb.	520 lb.
Air cleaner and heater	6 lb.	6 lb.	6 lb.
Exhaust pipes and collector ring	20 lb.	23 lb.	27 lb.
Nose cowling	6 lb.	6 lb.	6 lb.
Total weight to standard specification	402 lb.	460 lb.	559 lb.
Shipping weight (including box)	825 lb.	880 lb.	980 lb.
Size of shipping box	85 cu. ft.	85 cu. ft.	85 cu. ft.

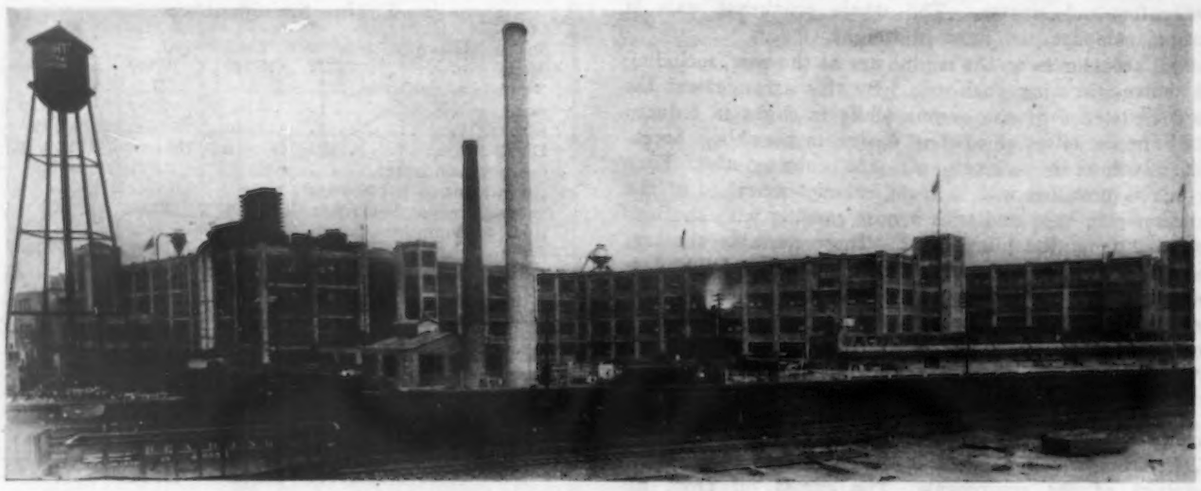
Relation of Power to R.P.M. and Fuel Used

Power curve diagrams, one of which is here reproduced, indicate the power output and fuel consumption of the engines at various speeds. The "Full Throttle Power" curve shows the average maximum power output at the engine speeds. The "Propeller Load" curve is based on the rated speed of each type of engine, showing the power output obtained at a given engine speed with the engine fitted with a propeller which will permit the engine to reach rated r.p.m. at full throttle. For example, the rated speed of the "Whirlwind Nine" is 2000 r.p.m.; reference to the "Propeller Load" curve for this engine shows a power output of 325 hp. at this speed; at 1800 r.p.m. the output is 236 hp., and so on through the range of the curve.

If the full throttle speed is above or below 2000 r.p.m., owing to the type of propeller fitted, then the propeller load curve will start at that point on the power curve corresponding to the maximum r.p.m. and will be similar in form to the propeller load curve drawn from 2000 r.p.m.

From the fuel consumption curve of the "Whirlwind Nine" it will be seen that, at the "Full Rich" position of the carbureter mixture control, the specific fuel consumption in pounds for each brake hphr. decreases from 0.60 at 1600 r.p.m. to 0.57 at 2200 r.p.m. on the "Full Throttle Power" curve. With the mixture control adjustment utilized to increase the proportion of air to fuel in the carbureter to the maximum point at which the engine still loses no r.p.m., the fuel consumption is as indicated on the "Best Setting" curve for full throttle power. The fuel burned ranges from 0.53 lb. to the brake hphr. at 1600 r.p.m. to 0.50 lb. at 2200 r.p.m.

These two curves show also how the fuel consumption



Main Plant of the Wright Aeronautical Corporation in Paterson, N. J.

can be varied at any fixed r.p.m. by using the mixture control. For example, at 1800 r.p.m. the fuel used varies from 0.518 lb. to 0.586 lb., according to the setting of the mixture control. The "Propeller Load" fuel curves indicate a similar variation of fuel consumption, corresponding to changes in r.p.m. and the position of the mixture control valve on the carbureter.

The upper "Propeller Load" fuel curve shows the fuel burned at various r.p.m. with a "full rich" mixture; the lower "Propeller Load" fuel curve demonstrates clearly the result of using the mixture control.

It should be noted that considerably lower fuel consumption than that indicated on the curves can be obtained in actual flight by intelligent use of the mixture control. The method of procedure is to set the mixture control at the "full rich" position and the throttle control at the point where the engine speed is from 25 to 30 r.p.m. above that required; the mixture control is then opened out to give the carbureter additional air until the engine r.p.m. have decreased to the required speed. The engine is then operating on the most economical mixture consistent with smooth running.

If it is desired to plot a fuel consumption curve for a propeller which allows a maximum engine speed above or below 2000 r.p.m., then the maximum r.p.m. of the required fuel consumption curve must correspond to the full throttle r.p.m. of the propeller load curve. The fuel consumption curve can then be plotted to follow in form the propeller load fuel curve on the diagram shown.

To convert the specific fuel consumption into gallons an hour, the specific consumption in pounds to the hphr. is multiplied by the horsepower output of the engine, the product being divided by the weight in pounds of a gallon of the fuel used. The resultant is the consumption in gallons an hour. The average weight of a gallon of aviation gasoline normally obtainable is 6 lb.

Synthetic Molding Sand Preferred by Dutch Foundryman

A FOUNDRY molding sand problem was discussed by H. Van Aarst in a paper "The Problem of Foundry Molding Sand," presented at the Third International Foundrymen's Congress in London, June 11 to 14. It was presented on behalf of the Dutch Foundry Technical Association.

As a result of experiments, the author prefers synthetic molding sand, because all natural sands, both as regards grain size and the clay content, are very irregular. From the beginning of 1928 the author has prepared loam, molding sand and core sand, using only river sand, sea sand, dune sand and clay. The loam consists of fine river sand, which is mixed with undried clay, to which flax waste and fine coal are added.

Two castings, made without a pattern, were cast in this loam. One was the half of a centrifugal pump (principal dimensions: length 14 ft., width 5¼ ft., height 9 ft., diameter of delivery tube 4.6 ft., weight 19,800 lb.; time required for casting, 45 sec.). The other casting was a stern tube for a motorship, which was cast vertically (time required for casting, 3½ min.; length 21.65 ft., weight 24,200 lb.).

Molding sand for dry molds is made of fine river sand, clay, flax waste and fine coal, mixed dry. In this sand both locomotive cylinders and the heaviest type of foundation plates are cast. It is also used for lighter castings, but it is then made up of a finer grain and without flax.

For core making, sea or dune sand is almost exclusively used, but for very large cores fine river sand is prepared. The sand is dried until quite free from water. Linseed oil is mainly used as a binding material.

Technical Paper No. 442 of the Bureau of Mines is entitled "The Blast Furnace Stock Column," by S. P. Kinney, North Central Experiment Station, United States Bureau of Mines, Minneapolis, Minn. It contains 148 pages and 62 illustrations and charts. It is a report covering another step taken by the bureau in investigations of iron blast furnace operations and discusses observations made of a 700-ton furnace, the previous studies having to do with a 300-ton and a six-ton furnace. Almost every phase of the operation of such a furnace has been investigated and the results are particularly valuable.

Europe's Industrial and Political Future Pivots on Coal and Iron Ore—II.

Old Systems of Assemblage and Distribution Cut Apart by Tariffs—Great Britain's Situation Most Serious—Germany Must Get Ore from France

BY EDWIN C. ECKEL*

IT is tempting to think of European mining and metallurgy as not having been seriously or permanently changed by the war; but that point of view embodies some serious errors. It is true, of course, that a shift in national boundaries gives to one country what was formerly controlled by another—to which extent no *total* change occurs. But if we stop at that point we overlook the fact that the old established metallurgical districts of Europe had certain long-standing relations with their raw material supplies and with their markets, and that in the new Europe many of these old systems of assemblage and distribution are now cut apart by tariff boundaries. So in speaking of the individual countries we must bear in mind these trade changes along with the more obvious changes in national control of raw materials and mills.

The Decline in British Mining and Metallurgy

Fifty years ago Great Britain was still the leading producer—as she had been for a century before that—of coal, pig iron and steel, and by far the leading exporter of each of these basal products. Today we see a Socialist-Labor party come into power in Great Britain chiefly because each of these three great industries is in a very serious condition, and because neither of the two old political parties could supply intelligence enough to meet those conditions. It is questionable, indeed, if the Labor party can do that; but it can at least attempt the task with a good will which has been lacking in the past.

Now, in trying to decide whether this decline of British industry is temporary or permanent—a matter of the first importance for all of us—there are several allied or related features which must be set aside for the moment if we are to reach any clear decision. We must not, for example, confuse Great Britain with the British Empire. We must not confuse industrial decline with financial weakness. For, whatever the condition and prospects of strictly British industry, the British Empire is still by far the greatest force in the world; and British financial strength is still not seriously weakened by her home industrial disturbances. In future, unless these industrial troubles be ended, these two statements will no longer be true; for imperial power and finance would decline in the long run with any permanent decline in the British coal and iron trade.

Unlike most of the other European countries, Great Britain did not gain or lose a single ton of coal or iron reserve as the direct result of the war. As in 1913, Great Britain ranks second to Germany among European coal-reserve nations, but still with a reserve tonnage equal to that of all the other European countries combined. As in 1913, Great Britain still has enormous reserves of very low-grade iron ore, and still habitually imports most of the ore from which she makes her iron tonnage.

The difference between conditions in 1913 and in 1929 is chiefly social and not strictly material. During the war Great Britain supplied coal and iron to all her allies, in the maximum tonnages possible—and at the maximum prices that could be secured. In order to produce this tonnage under war conditions wages were raised far above pre-war levels; and the Government aided mine owners where necessary to keep production up. After the war the laborers refused to have wages reduced as export prices fell. A shorter mine day was introduced, with resultant lower output per man employed.

Meantime the trade of the world in general fell off very sharply and has not yet recovered. Countries which were formerly good customers have erected steel plants and tariff barriers simultaneously, not the least of them being British dominions and colonies. With all these weights to carry, the British coal and iron industries have been stagnant at best and depressed at worst; and unemployment has risen to chronic and alarming proportions. It is this situation which has defeated the Conservative and wrecked the Liberal parties in England. It is this situation which, unless remedied, will drive the Labor party further and further into Socialistic remedies.

The weak points of the situation are that practically all foods and raw materials have to be imported from high-cost countries; so that English living costs and wages will normally be far above French or German levels. The strong points of the situation are the location of almost all the coal fields and most of the iron works on or near the coast, the preeminence of the British merchant marine, and the existence of old trading outlets in South America and elsewhere.

France Has Greatly Increased Ore Exports

Before the war France was a heavy exporter of iron ore, because most of the output of the Briey-Longwy basin went across the border to German furnaces. Since the war, though some of these same furnaces became French in nationality, the French ore export has been heavily increased. Over half of the Normandy-Anjou output goes to either English or German furnaces now.

With regard to coal supplies, France has gained litt'e by the war. With the exception of two mines on the French edge of the Sarre basin, returned to France by the treaties, there has been no permanent accession of coal lands. The Sarre field itself, which is to be under French operation until 1935, will probably go back to German control by a plebiscite in that year, so that its 12,000,000 tons of annual coal output cannot be looked upon as French. Recent data on actual French coal outputs for 1927 and 1928 are as below in metric tons:

Coal Field	1927	1928
Pas de Calais	24,299,220	24,042,408
Nord	8,919,400	9,223,145
Moselle	5,365,800	5,554,660
Loire	3,970,540	3,716,023
Blanzy-La Mure	3,104,820	3,020,641
Gard-Graissessac	2,235,980	2,174,330
Carmaux	2,095,300	1,994,254
Other	1,787,470	1,640,316
Total coal	51,778,530	51,365,777
Total lignite	1,067,290	1,063,691

*Mr. Eckel is spending several months in Europe in the interest of American clients, this being the fourth of his extended investigations there since the war. His close-range study of industrial conditions in Western Europe began with his engineering service in the A. E. F. as major, from July, 1917, to July, 1919. One phase of that experience was the operation of several cement mills with troop and civilian labor. He is the author of two works dealing with cement materials, also of "Coal, Iron and War."

With regard to iron ore resources, the events of the past 15 years have placed France not only first in Europe but probably first in the world. For, in addition to gaining by conquest half of the largest of the world's ore fields, another of almost or quite equal size has been developed on her own soil.

Five Billion Tons of Lorraine Ore

In terms of reserve ore tonnage we may assume that France now has in the entire Lorraine basin some 5,000,000,000 tons of ore, capable of producing some 2,000,000,000 tons of pig iron. In the Anjou-Normandy basin recent work would suggest a total ore reserve of at least 2,000,000,000 to 3,000,000,000 tons of far higher grade than the Lorraine product, and capable of yielding between 1,000,000,000 and 1,500,000,000 tons of pig metal, perhaps more.

As against all this tonnage the reserve is being drawn upon in the fashion shown below, where for convenience of historic reference the old German districts are separated from the pre-war French Lorraine regions. The official figures for 1928, recently issued, are used, supplemented by earlier data for comparison:

Iron Ore Output of Present French Districts, 1913-1928—Metric Tons

District	1913	1927	1928
Briey-Longwy-Nancy ..	19,979,937	23,872,040	26,162,582
Metz-Thionville (German)	21,136,265	19,210,980	20,404,150
Anjou-Normandy	1,212,911	2,296,340	2,497,601
Other French districts.	726,023	291,560	263,509
Total French ore output	43,055,136	45,670,920	49,327,842

It will be seen that the old German Lorraine fields have shown a slight loss since 1913; that the old French Lorraine fields have increased some 35 per cent, and that the Anjou-Normandy-Brittany field has increased some 100 per cent.

German Coal and Iron

At the opening of the World War the German Empire was currently credited with possessing close to 60 per cent of the entire European coal reserve and some 30 per cent of the total iron ore reserves. The war has reduced these percentages—the coal not too seriously, for the German total is still close to half of the European reserve; but the iron ore very sharply, so that today the German Republic holds perhaps 7 to 8 per cent of the total. The coal decrease was due to the temporary alienation of the Sarre field and to perhaps more permanent losses in Silesia. The iron ore loss was due almost entirely to the loss of Lorraine, only a relative trifle being in the Silesian fields.

This leaves Germany with the Westphalian coal field intact and with every reason to press coal output there and to develop new utilizations for coal and for its by-products. But as regards iron and steel, it implies that to produce them on the old scale of output there must be heavy importations of iron ore. These importations, as we know, are actually in progress, chiefly from France, with Sweden, Algeria and Newfoundland following, at great distances, in the order named.

The extent to which the various basal industries have been reestablished since the war is well shown in the following comparison of average *monthly* outputs during 1913, 1926, 1927 and 1928. The figures are in thousands of metric tons:

	1913	1926	1927	1928
Coal output.....	15,849	12,114	12,298	12,500
Lignite output....	11,506	11,656	13,399	14,250
Pig iron.....	1,397	804	1,310	985
Steel output.....	1,412	1,028	1,371	1,210

It will be seen that lignite shows a very steady and rather surprising gain, while coal, iron and steel are still well below their pre-war levels of output. And if to these mere tonnage comparisons we add the fact that almost all the iron is made now from imported iron ore, we can see why the German credit balances on exports, never very large before the war, are now turned into deficits.

Germany still ranks second to the United States in the production of both pig iron and steel. But whereas in 1913 England occupied third place in both regards, and France only a very bad fourth place, today France has easily passed Great Britain and is surprisingly little behind Germany. I can see no reason, except perhaps the urgent pressure of reparations payments, for German retention of second rank in the output of pig iron for more than a few years now. Her hold on the finished steel industry is far more secure, since the factor of ore cost weighs less and less as the product is more and more highly finished.

Prospects of Central and Eastern Europe

In central and eastern Europe there are only three countries that seem to require consideration from the standpoint of international coal and iron trade, and each of these is limited in one way or other, so that it can never reach the levels attained by the United States, Great Britain, Germany or France.

First among the three as a future possibility is Russia, where even misrule cannot always cover up the fact that the Donetz Basin had large coal reserves and sufficient iron ore reserves to present possibilities of becoming some day a very serious mining and manufacturing region. The deficiency there has always been the relative lack of transportation and the poverty of the local markets. The outputs for all of Russia have just been published for two recent half-years as below, all in metric tons:

	Oct. 1-March 31, 1927-28	Oct. 1-March 31, 1928-29
Coal mined	18,503,000	19,744,000
Pig iron	1,622,000	1,877,000
Steel	2,109,000	2,314,000
Rolled products	1,702,000	1,874,000

It will be seen that while pig iron output increased almost 16 per cent for the year, coal output increased less than 7 per cent, which the Soviet report expressly states was due to "a certain lowering of working discipline in the coal fields."

Poland and Czechoslovakia, both remade countries, present certain possibilities and serious differences. Poland has secured coal in excess of her manufacturing needs or probabilities, and this coal is now depressing the German coal trade in all the Baltic region. Czechoslovakia, the best balanced of the new countries, has sufficient coal to be important, enough iron ore to use, and finishing plants on a relatively large scale, so that the mine and furnace output is readily absorbed nationally without affecting any international markets in basal products.

Diesel Engine Heads of Wrought Iron Joined with Copper

Many breakages have occurred in lower cylinder heads on double-acting marine Diesel engines. It is apparently impossible to arrange valve openings symmetrically, and temperature strains induced are too much for the best cast iron to resist.

An alternative successful design was described recently by F. Sass to the Institution of Engineers and Shipbuilders in Scotland. It consists of assembling the complicated head with all its passages from 18 pieces of wrought iron plate, tubes and angles. After these were tightly held together by suitable clamps, the proper amount of copper was wired at each joint, and the assembly heated in a hydrogen atmosphere to 1200 deg. C. Final cooling required 48 hr. The method is similar to the "coppering" process described at length in THE IRON AGE, May 10, 1928. Mr. Sass said the method had long been used for building up diaphragms in the turbine department of the German General Electric works (A.E.G.).

Pulverized Coal in Steel Furnaces

Application of Powdered Fuel to Metallurgical Work Outlined—Both Melting and Reheating Furnaces Served

BY WILLIAM O. RENKIN*

THERE have been approximately 200 pulverized coal plants installed in connection with the iron and steel industry in this country. These pulverized coal plants supply fuel to about 2500 furnaces of the following types:

Puddling and busheling furnaces
Wrought iron pile and faggot heating furnaces
Ingot, slab, billet and rod-heating furnaces
Forge heating furnaces
Rail reheating furnaces
Continuous heating furnaces
Open-hearth furnaces
Sheet and pair furnaces
Open and box annealing furnaces
Malleable iron melting furnaces.

In the paper the author has given information regarding results being secured, rather than to describe equipment. The paper is divided into nine sections:

1—Historical sketch of pulverized coal in metallurgical work, giving credit to Lord and Culliney, who did the pioneer work in this branch of the industry.
2—Types of furnaces using pulverized coal, giving some descriptive data.
3—Fuel costs per ton of product, giving some data on the preparation costs as well as relative costs per ton of steel heated with various fuels, such as: Hand firing with bituminous coal; producer-gas firing (bituminous coal); fuel oil firing; natural-gas firing; by-product coke oven gas firing and a curve chart showing the relative B.t.u. procurable for one cent.
4—Type of equipment required, giving a general description of pulverized coal plant operation rather than equipment details.
5—Advantages of pulverized coal firing, listing under 10 points the advantages and benefits to be derived by using pulverized coal.
6—Furnace efficiencies being secured, giving some data from operation.
7—Elimination of early difficulties, describing some of the early installation troubles and explaining methods of overcoming them, as found by experience.
8—Comparative outputs with different fuels, giving some examples of results obtained.
9—Conclusion, giving some general information and comparative fuel costs.

Some of the particular furnace applications are discussed in the following paragraphs:

Iron Blast Furnaces

Considerable work has been done in the blast furnace branch of the industry, but difficulty has been encountered in getting the pulverized coal to burn and not to precipitate. It has been found possible to feed the pulverized coal directly into the proper part of the blast furnace, thus overcoming, it is believed, the mechanical difficulties which have heretofore prevented proper injection of the coal. Introduction of fuel having a known analysis directly at the melting zone will, no doubt, prove a distinct advantage in correcting errors in mix immediately, instead of after some hours, as in present practice.

Air Furnaces

There are many malleable iron plants in which the melting is done with pulverized coal, and the furnaces for such fuel have been developed to a very high stage of efficiency. In the plant which holds the fuel-ratio record of the United States, 3.8 lb. of iron is melted with each pound of pulverized coal fed to the furnace, or 7,430,700 B.t.u. in the fuel to each 2000 lb. of iron melted. The proximate analysis of the coal used at this plant is:

	Per Cent
Volatile matter	34.8
Fixed carbon	59.0
Ash	5.5
Moisture	0.7
Sulphur, separately determined, less than	1.0

In addition to the exceptionally good fuel-ratio secured by fine grinding and proper drying, combined with an efficient burner arrangement, there has been noticed a decided improvement in the elimination of carbon and sulphur additions to the bath. Practically all air used for combustion of pulverized coal in this industry is at atmospheric temperature, and the present rapid development of suitable air heaters, using the furnace waste gases as a heating medium, will greatly assist in further reduction of fuel consumed.

Open-Hearth Furnaces

Owing to the early difficulties encountered with pulverized coal and the high state of development of these furnaces for gaseous and liquid fuels, there has been little incentive to push pulverized coal as a fuel for open-hearth work. However, the experience of plants operating with pulverized coal shows that this fuel can be used successfully and with a considerable saving compared with oil, natural gas, or city gas.

Open-hearth plants which have been using pulverized coal report successful operation, with fuel consumption ranging from 450 lb. to 600 lb. of coal for each ton of steel. The Eastern Steel Co.'s plant at Pottstown, Pa., has found that a coal having a higher ash content can be used, by grinding more uniformly and drying better.

Early troubles with checkers becoming clogged and deleterious additions of sulphur, as well as ash, to bath prevented the proper advance of this fuel. We have, however, found that these difficulties were mainly caused by improper preparation of the fuel. By getting the coal pulverized so that a sufficient percentage will pass through a 100-mesh screen, with the minimum amount of impalpable powder, we find that the sulphur and ash do not precipitate on the bath, but are carried over into the slag pockets at ends of furnace.

By elimination of checker bricks and the substitution of simple arches it is possible to secure sufficient preheat in the combustion air and get better control of the furnace. It is predicted that within the next few years open-hearth furnaces will be developed which will utilize finely pulverized coal at a fuel consumption of 400 lb. or less per ton of steel melted.

Reheating Furnaces

Many installations of hearth-type side-door furnaces, both in single-end-reverberatory and double-end-reversing design, are giving excellent results. Generally speaking,

*Combustion Engineering Corporation, New York. This is an abstract of a paper read June 20 before the Association of Iron and Steel Electrical Engineers at the annual meeting and exhibition, held in Pittsburgh.

the range in size of material heated in this type of furnace is so great that good efficiency cannot be secured. Yet in furnaces heating steel sections varying from billets weighing 150 lb. to ingots weighing 11,000 lb. the fuel consumption ranged between 350 and 450 lb. of coal per gross ton heated.

In one plant where the range is not so great, the size of material heated being from 4 in. square to 8 in. square, the fuel saving, compared to producer gas, was 100 lb. of coal. Forge furnaces heating slabs and ingots for heavy forge work, where the material must be given two heats, show fuel consumption of 600 lb. of coal per gross ton, including the production of approximately 100 boiler-hp. of steam.

Continuous furnaces are generally of either the end-discharge or side-discharge type. Experience has shown that length of skid pipe from knee to cold end wall and the width of furnace determine the output capacity. But the kind of fuel used greatly affects this output. In properly designed furnaces, pulverized coal will sometimes give an increase in output, over other fuels, as high as 60 per cent.

Heating of steel billets, blooms and slabs requires a mellow flame, with minimum luminous streaks, as this is the type of flame whose heat will penetrate the steel with the minimum surface damage and insure the quickest, most uniform heat throughout. Furnaces using pulverized coal require a lower damper than with other fuels, so as to keep the furnace well filled with heat.

Furnace design should be such as to insure practically complete combustion before the gases cross the bridge wall. The roof should be so designed as to insure the proper position of hot spot. Flat roofs of the suspended type give a more uniform heat across the furnace width than do arch roofs. Wherever possible the combustion chamber should be so placed that a portion of the heat can travel under the steel.

In heating sheet bar and sheets, owing to the need for low-temperature flame control, the central plant bin system has proved the most successful. Pulverized coal is today in successful use alike for high-grade, full-finish and ordinary sheets. Combination sheet and pair heating furnaces on ordinary-finish, or tight iron, are successfully producing sheets with 160 to 180 lb. of pulverized coal per net ton of sheets.

Continuous pair heating furnaces are in general use, and give exceptionally good results. In one 8-hr. turn, one mill, using pulverized coal, heated and rolled 400 pairs of bars, 16,320 lb., and put 1600 sheets, 30-gage, 36 x 72 in., weighing 11,780 lb., into warehouse without any wasters or cut-downs. The same mill heated 744 pairs weighing 22,989 lb. on another 8-hr. turn, and on a third it heated 546 pairs weighing 23,840 lb.

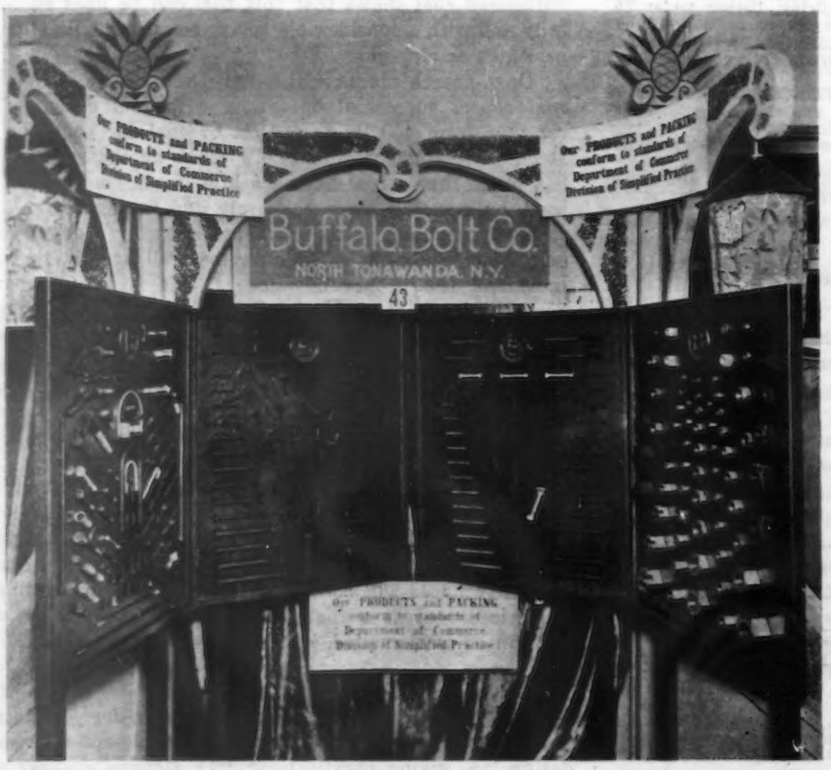
Sheet furnaces of the double-chamber type are operating successfully on pulverized coal, with an average fuel consumption of 151 lb. of pulverized coal per net ton of sheets heated. At the pulverized-coal-fired plant 356 lb. of coal per net ton of steel heated was required for sheet-and-pair-heating and annealing. The above results were all obtained on the production of tight or ordinary finished sheets. For the production of full-finished high-grade sheets specially designed furnaces are required, and the fuel consumption is slightly higher.

Annealing Furnaces

There are some open-flame and continuous type sheet annealing furnaces using pulverized coal successfully, but the principal use of this fuel is in connection with box annealing furnaces. Sheet annealing for both tight and full finish as well as electric steel is being done successfully in many plants. Fuel consumptions of 140 to 182 lb. per ton of sheets are being secured.

In annealing malleable castings fuel ratios of 5 to 1 are being secured, with practically all good castings.

Increase in life of boxes helps to reduce the cost of annealing. Box annealing furnaces in successful operation are of the single-box double-chamber, as well as double-box double-chamber type.


Our PRODUCTS and PACKING conform to standards of Department of Commerce Division of Simplified Practice
Buffalo Bolt Co.
NORTH TONAWANDA, N.Y.
43
Our PRODUCTS and PACKING conform to standards of Department of Commerce Division of Simplified Practice

Company Emphasizes Approval of Simplification Program

TO further the work of the Division of Simplified Practice of the Department of Commerce in the simplification programs carried out in numerous industries, the Government department has requested manufacturers who exhibit at trade conventions to state that their products and packing conform to the standards agreed upon by the industry. The illustration shows the manner in which this was done by the Buffalo Bolt Co., North Tonawanda, N. Y., in its booth at the recent convention of the National Association of Purchasing Agents in Buffalo.

Colorimetric Carbon Test Improved

New Equipment Facilitates Comparison of Color Intensities—Details of Apparatus and Method

BY H. L. CAMPBELL*

ANALYSIS of steel for carbon by the colorimetric method is not a difficult task and may be performed satisfactorily by anyone after a little practice. The advantages of this method over other methods for determining carbon are the small amount of equipment required and the speed of obtaining the results of analyses. Much of that used today is crude. That described in this article was designed by the author and is offered as facilitating the comparison of intensity of color.

The equipment required for the color-carbon determination consists of an analytical balance, a water bath, a colorimeter with glass tubes, and some test tubes ⅝ in. in diameter and 6 in. long.

Water Bath and Colorimeter Simply Constructed

The design of the water bath is shown in Fig. 1. It consists of a copper tank 9½ in. in diameter and 7½ in. high. On the inside of this tank is a movable support for test tubes. A cylinder of sheet copper 8 in. in diameter and 5½ in. high is provided with holes ¾ in. in diameter near the bottom and near the top to assist the circulation of the water in the tank. A cover, which is attached to the top of the cylinder, has openings into which 16 test tubes may be placed. A piece of wire screen is soldered to the copper cylinder within 1½ in. from the bottom. The test tube support may be raised from the tank by a handle which is fastened to the center of the test tube support shown in Fig. 1. The level of water in the tank is indicated on the stem of a glass funnel which is inserted in a rubber stopper at the side of the tank. The water bath may be supported on a tripod or ring stand. Heat may be applied to the tank by means of a ring burner or any type of laboratory gas burner.

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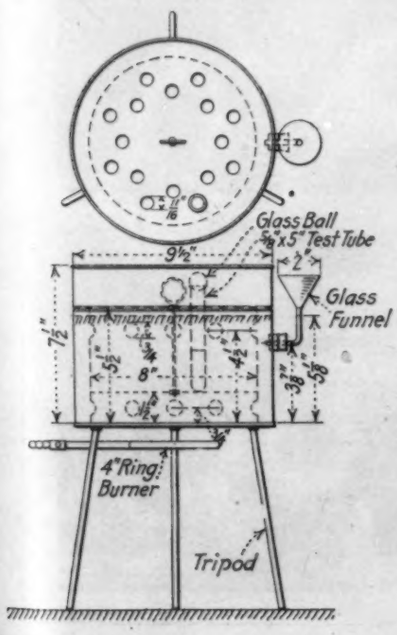


Fig. 1.—Design (Left) of the Improved Water Bath

Construction of the colorimeter is shown in Fig. 2. At one end of an inclosed wooden box an electrical connection is made to an electric light socket on the inside of the box. A blue, daylight bulb is used in this socket. At the other end of the box is a wooden tube through which observations are made. A block of wood forms a partition which divides the inside of the box in two compartments. In this wooden block two round holes are made 9/16 in. in diameter and 5⅛ in. long, as shown.

Directly in line with the opening in the wooden tube, a rectangular hole is cut through the block. A strip of sheet brass is placed across the center of this hole. This strip of brass serves to separate the two glass colorimeter tubes when they are placed in the colorimeter. The round holes 9/16 in. in diameter are continued through the cover of the box. These holes serve to hold the color-comparison tubes during a test. The colorimeter may be placed in any position which will permit convenient observations through the tube of the instrument.

Solution Required and Method Used

The solution required for dissolving the steel samples consists of equal volumes of nitric acid and distilled water. Details of this method of analysis are as follows:

Use 0.200-gram samples of steel and place in test tubes which are set in a bath of cold water. At the same time weight out a 0.200-gram sample of a standard steel which has approximately the same composition as the unknown steel.

A proper amount of nitric acid solution is added from a burette to each test tube; for carbon up to 0.3 per cent, use 3 cc. of acid; for carbon up to 0.5 per cent, use 4 cc. of acid; for carbon up to 0.8 per cent, use 5 cc. of acid; for carbon up to 1.0 per cent, use 6 cc. of acid.

The test tubes are left in the cold water until violent action ceases. Then the water is heated slowly up to 80 deg. C., which should require about ½ hr. The mouths of the test tubes are closed by glass balls to prevent drying of the iron salts on the sides of the tubes. The tubes are shaken several times during the heating periods. After the reactions are completed, the tubes are placed in a bath of cold water.

A solution of the standard steel is poured into one of the comparison tubes. The solution is diluted to a con-

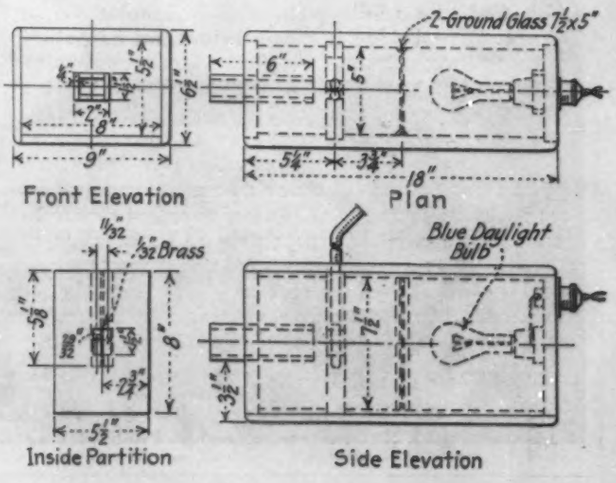


Fig. 2—Details (Right) of the Construction of the Colorimeter

venient multiple of the carbon content of the standard. For example, 0.45 per cent carbon sample may be diluted to 9 cc.; then each cc. will represent 0.05 per cent carbon.

In the other comparison tube, dilute the solution of one of the unknown steel samples until it matches the color of the standard.

Calculating Carbon Percentages

The percentages of carbon in the two samples are to each other as the volumes of the solutions in the comparison tubes. If each cubic centimeter of the solution of the standard represents 0.05 per cent carbon, and 13 cc. is the volume of the solution of the unknown steel when the colors match, the carbon content of the unknown steel is 0.65 per cent.

The standard steel used in this method must be of exactly the same kind as that to be tested, and also similar in its composition and of approximately the same carbon percentage.

Copper, cobalt and chromium interfere with this determination. High sulphur may make the solutions slightly turbid.

Standard samples of steels with different carbon contents may be obtained from the United States Bureau of Standards, Washington.

It is desirable to obtain a quantity of borings from a representative sample of the steel which is being produced and to use this material as a standard for color-carbon determinations, after establishing definitely the carbon content of the standard.

Fusion Welds in Duralumin

Fusion welds can readily be made in sheet or strip duralumin, according to *Oxy-Acetylene Tips* for June. If the adjoining edges are flanged and a corrugation made parallel to the seam about 2 in. from the weld, the expansion and contraction effects will be absorbed. The seams should be opened at one end an amount equal to ¼ in. per foot of weld. Welding should be continuous and produce a well-reinforced seam; rewelding cannot be done.

Welding rods of aluminum containing 5 per cent silicon are satisfactory; this alloy has a lower melting point than duralumin, and some of the contractions in the joint occur before the weld metal is entirely solid. Joints and rod should be scrupulously clean and coated with the flux ordinarily used for welding aluminum, mixed with water to a creamy paste. During welding the oxy-acetylene flame should be given a semi-circular motion with the rod at the center of the circle; the flame is so inclined as to preheat slightly the metal next to be welded. The finished joint should be scrubbed clean of flux with hot water.

Such welds, while perfectly tight against benzol, have a maximum tensile strength of 30,000 lb. per sq. in. If the completed part is quenched in cold water from about 900 deg. F. and then tempered in boiling water, the average tensile strength should be about 43,000 lb. per sq. in. (figured on the cross section of the sheets joined). This compares with 55,000 to 63,000 lb. per sq. in., the average strengths of common duralumin after heat treatment.

Polished Allegheny Metal Sheets Cover Corridor Bridge

ALLEGHENY metal with its glistening silver-like finish covers the pedestrian bridge which now connects the new Chicago Daily News Building and the Northwestern Railroad Terminal, Chicago. It is a chrome-nickel iron, proved to be practically impervious to the corrosive action of the elements, and to withstand severe weather conditions without losing its highly polished finish. Only an occasional wiping with a damp cloth is needed to maintain the luster.

The 5 tons required for the roofing, window frames, and siding of the 125 ft. span were furnished by Joseph T. Ryerson & Son, Inc. The bridge was built jointly by the Chicago *Daily News* and the Northwestern Railroad for the convenience of some 60,000 commuters, who in the past were forced to wait many minutes daily in crossing the heavily congested street between the two buildings. Incidentally, both buildings are using installations of Allegheny metal in their cafeterias. The sheet metal work was done by J. Smith and the windows by the Voigtman Co., Chicago. The bridge is shown below and its position between railroad station and the new building is shown by the arrow in the other picture.

Signs of Overproduction Appearing

Steel Output 45 Per Cent Above Normal, with Demand Falling Off—No Sharp Decline Expected

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

OUR SURMISE that June would show a decided excess of steel production over indicated current requirements has been confirmed. In May, our "composite demand line," based on the activity of the chief consuming industries, declined while steel production increased, and preliminary estimates for June show a continuation of these divergent trends.

This is the first time that a similar situation has appeared since April and May in 1927. Even then, the indicated consumption declined less sharply than last month, and production of steel was relatively less in excess than now appears to be the case.

What this development may mean is uncertain, but apparently we can no longer say that steel production is well balanced with relation to current requirements. It seems fair to say that, on the average, production considerably exceeds requirements. Also it can be said that, if the production is not actually in excess of orders, then the orders are themselves being placed in excess of actual requirements. Statistics throw no light on the latter possibility. All we know is that unfilled orders decreased so much less than usual in June, in spite of the heavy production, as to be equivalent to a virtual increase.

The decline in the composite demand line during May resulted from a downward trend in our adjusted indexes of building activity, automobile production, mining, and exports of iron and steel. Declines in these items more than offset small increases in railroad transportation and in general manufacturing activity.

Chief Consumers Show Declines

Preliminary estimates for June, based on automobile, building and railroad figures (which industries taken together consume half of the steel output), indicate a somewhat larger decline in current requirements than occurred in May. Even allowing for the usual seasonal decline, automobile production was reduced more sharply than in May. It is still very large, but continues to point downward. Building activity was off again and showed the lowest annual rate since 1924. Railroad car loadings fell below May, declining a little more than usual for the season.

This gives a sufficient basis for estimating a downward trend and, as steel production increased sharply in June leads to the conclusion that unless the output is curtailed soon, a condition of over-supply is in the making.

Of course, the activity of consuming industries may pick up. But in what direction does this seem probable? Certainly no sustained advance in building activity is to be expected so long as money remains tight and the bond market is depressed. Automobile production promises to continue large, but its downward trend now seems well established, particularly in the heavier cars. Mining activity is limited, as coal is one of the depressed industries, while copper prices can be maintained only by curtailing production and the oil situation is uncertain, to say the least. Assuming the soundness of these statements, we can hardly expect railroad traffic to expand, considering the season, especially with the recently announced reduction in the estimates of the wheat crop. On the whole it seems that, in spite of the large construction projects, such as pipe lines, and a very good volume of railroad equipment business, steel requirements, both domestic and export, seem likely to decline moderately rather than to expand. The indicated requirements as of June, however, continue very large, being considerably greater than in most of the months of 1927.

Construction and Automobiles Both Point Downward

BRIEFLY, the facts concerning two of the steel industries' customers are as follows:

Building contracts, according to all measures, were off more than usual in June, and were much below a year ago. Our adjusted index based on floor space, and taking the average of the years 1921-1927 as 100, was 101.1. This compares with 109.7 in May and 130.6 last year. It represents the poorest showing made, probably, since November, 1924, and certainly since March, 1925. Moreover, the value of contemplated new construction declined, and permits were sharply reduced. Building permits in 180 cities, making due allowance for seasonal variation, were the lowest since 1921. This situation finds expression in the relatively unfavorable showing made by lumber, cement, brick, sanitary enameled ware, radiators, boilers, galvanized sheets and nails.

Preliminary estimates for automobile production put June at 536,300 cars and trucks, which is an average of about 21,450 a day, against 24,440 in May. This represents a more than seasonal drop and our preliminary adjusted index based on the average of 1921-1927 is 161 against 171 in May and 122 a year ago. May sales by General Motors made an unfavorable showing, as cars sold to consumers fell behind a year ago and dealer inventories showed an unseasonable increase. The two leading manufacturers of low-priced cars are running strongly, but the total production of all cars is evidently ahead of sales and a more than seasonal curtailment that began in May is still under way.

Though both of these industries are thus on the decline, building contracts are still above the average of recent years, and automobile production shows a rate about 60 per cent above that average.

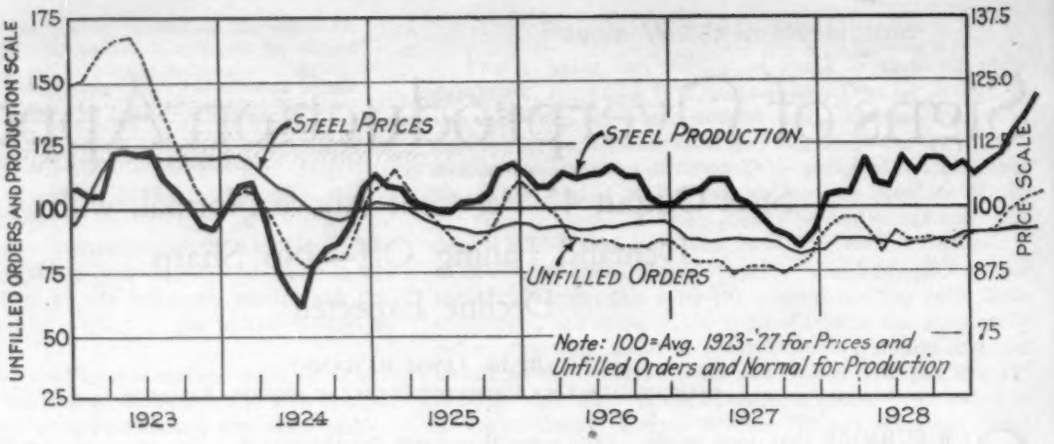
Outpouring of Steel Ingots at Record Rate

THERE was an extraordinary increase in our June index of average daily steel production. This is the only time since 1922 that steel production has increased considerably more than usual for the season in that month. In 1926 there was a slight gain, but it was not considerable. Only in 1922, during the rapid recovery from the depression of 1921, do we find such a rise at this season. And in 1922 steel prices were rising and unfilled orders rapidly increasing.

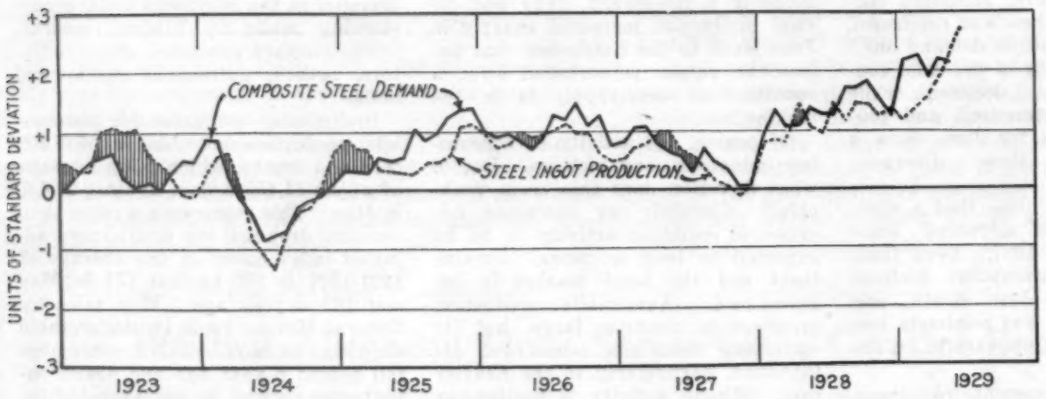
The index referred to as nearly 45 per cent above normal and stands at a level unapproached in any post-war year. Unless the industry is in the process of overturning all precedent, such an abnormal rate of production, in excess of indicated requirements, cannot long endure. Barring the unlikely event of an inflationary spurt in general business this fall, a declining trend is to be expected within a very few months.

Unfilled orders decreased slightly, but considerably less than usual for

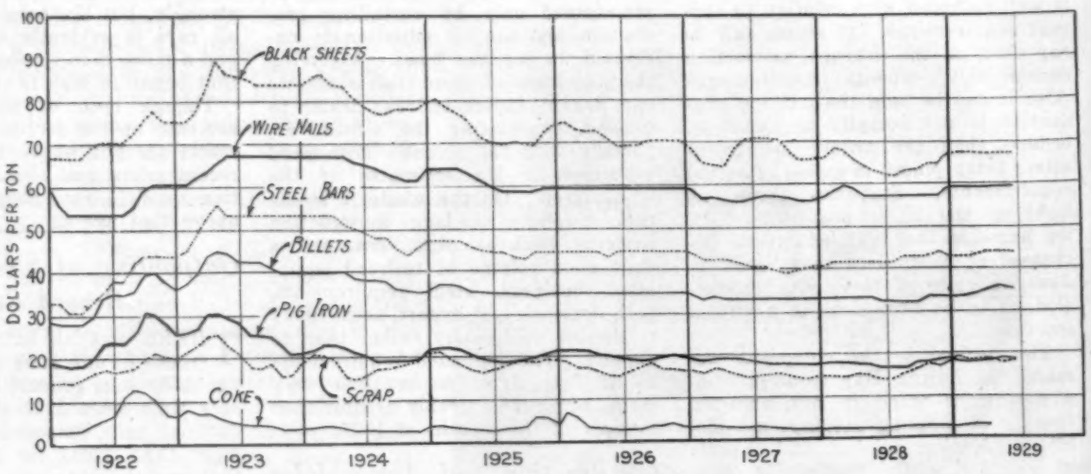
STEEL Production in May Was 36 Per Cent Above Normal Requirements and Went Up to 45 Per Cent in June. Prices may have reached a peak. Unfilled orders decreased by less than a seasonal amount



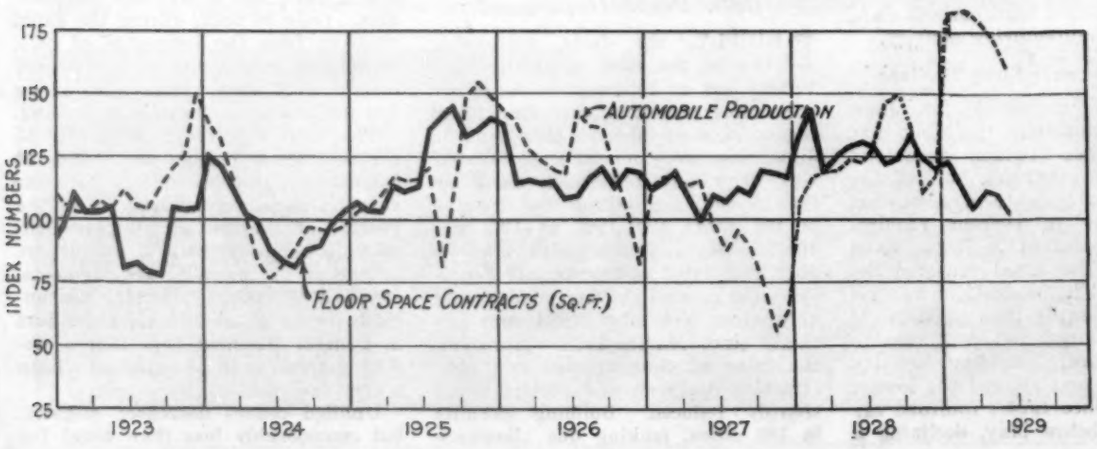
COMPOSITE Steel Demand Has Fallen Well Below the Level of Ingot Production (Adjusted). It is believed that demand will show a further moderate decline



COMPARED with Coke and Semi-Finished Steel Prices, Pig Iron Seems to Be in About a Normal Position; But It Is Relatively Cheap When Compared with Either Steel Scrap or Most of the Items of Finished Steel. It shows no present tendency of strengthening



AUTOMOBILE Output, at High-Record Levels, Has Declined and Will Drop Lower. Building has been moving downward again since the temporary April upturn



the season, our adjusted index rising to 105.5 per cent of the average for the five years 1923-1927, which compares with 90 per cent a year ago. This is the highest level of unfilled orders, considering the season, since January, 1926, when the index was 106.4. Evidently the usual sequence of events is working out and forward buying has increased more than had been anticipated. In view of the heavy production and shipments during June, the showing is remarkable.

Yet the average price of finished steel remains unchanged at only 95.6 per cent of the five-year average. This compares with 92.7 per cent a year ago. The failure of prices to advance, to say nothing of the reported weakness in some items, while unfilled orders and production have increased, suggests that the end of the expansion period is near. It indicates the approach of a decline in unfilled orders. The present rate of steel production can hardly be maintained without that result.

High Pig Iron Output Is Yet Below Steel

ON the other hand, pig iron production held practically level in June, at a rate of 26.7 per cent above estimated normal. This is a very high rate—the highest since July, 1923—but it is notable as being the lowest in comparison with steel production since July, 1922.

In 1922 there was a similar sustained mid-year output of steel, the production curve running above pig iron as much as it did last month. This is an interesting situation. Rarely do we find a peak in the steel cycle without pig iron production running relatively high as compared with steel production. Thus precedent in this respect suggests that further expansion in pig iron production lies ahead, although at present pig iron prices seem too low to allow such a development. At an average of $18.65 in June, THE IRON AGE composite price compares with $18.70 in May and is only 87.2 per cent of the five-year average.

Some Maladjustment in the Price Structure

WE thus find many unusual and conflicting indications. Perhaps the condition of pig iron prices is characteristic of the whole situation. Compared with coke, billets and bars, pig iron prices are about normal. Compared with steel scrap and the average price of finished steel, pig iron may be called cheap. Now that steel production is so high in comparison with pig iron production, a stronger pig iron market would ordinarily be considered probable.

Yet pig iron production has probably never been long maintained at the existing high levels without a decline in prices, and the monthly average of pig iron prices was lower in June (as predicted), a fact that generally has some significance, because this index rarely reverses itself abruptly. Moreover, the building situation has reduced the demand for heating and plumbing fixtures and the weakness of the bond market is reflected in the dullness of the cast iron pipe demand.

Probably this mixed situation means a mixed market, with no decided general trend in the very near future. In general, mixed trends seem probable as to steel prices, the markets varying with the demand, with some weakness where building or automobile uses are the chief factor.

June British Iron and Steel Output Large

LONDON, ENGLAND, July 15 (*By Cable*).—June production of pig iron was 657,800 gross tons and that of steel ingots and castings was 830,900 tons. The June pig iron output was the largest this year, while that of steel was the third largest, which was the 859,900 tons in March.

Comparisons of present output with other years is as follows:

	Pig Iron, Gross Tons	Steel Ingots and Castings, Gross Tons
1913—Av. monthly..	855,000	638,600
1920—Av. monthly..	669,500	755,600
1922—Av. monthly..	408,500	490,100
1923—Av. monthly..	620,000	706,800
1924—Av. monthly..	609,900	685,100
1925—Av. monthly..	519,700	616,400
1926—Av. monthly..	203,500	296,700
1927—Av. monthly..	607,800	758,200
1928—Av. monthly..	550,900	710,400
1929—Av. first quar..	553,000	801,400
1929—April	611,300	808,600
1929—May	654,800	840,400
1929—June	657,800	830,900

The monthly average pig iron output for the half year was 597,900 tons, exceeding the 1928 monthly average of 550,900 tons. Steel output for the first half has averaged 814,000 tons per month, comparing with 710,400 per month last year. The rate this year is the highest since the war.

Seek Funds for Industrial Standardization

The board of directors of the American Standards Association has decided to launch an extensive national campaign to finance industrial standardization activities on a basis merited by the savings which these activities are securing for American industry. A finance committee, consisting of Bancroft Gherardi, chairman, Quincy Bent and Howard Coonley, was appointed to head this effort.

The association is a national federation of 40 government, technical and trade associations and includes in its membership the United States Department of Commerce, of which the Bureau of Standards is a division. It serves to impart a definite status to standards which are prepared by industry in accordance with the association's procedure, through declaring them American standards, after a consensus has been reached among the various groups substantially concerned—producers, consumers, distributors and general interests.

Small Loss in Corporation's June Orders

A small decrease was registered in the unfilled orders on the books of the United States Steel Corporation in June after a fairly large decline in May. Previous to May there were five successive monthly increases. The June decrease was 47,257 tons as compared with 123,596 tons in May. A year ago there was an increase in June of 220,991 tons. The table gives the data for the last 18 months.

	1929	1928
Jan. 31.....	4,109,487	4,275,947
Feb. 28.....	4,144,341	4,398,189
Mar. 31.....	4,410,718	4,335,206
Apr. 30.....	4,427,763	3,872,133
May 31.....	4,304,167	3,416,822
June 30.....	4,256,910	3,637,009
July 31.....	.....	3,570,927
Aug. 31.....	.....	3,624,043
Sept. 30.....	.....	3,698,368
Oct. 31.....	.....	3,751,030
Nov. 30.....	.....	3,673,000
Dec. 31.....	.....	3,976,712

Civil service examinations for mechanical engineer on mine equipment are to be held by the United States Civil Service Commission, Washington. Applications must be on file not later than Aug. 14. The entrance salary is $3,800 a year. Information may be had from the commission or at the post office or custom house in any city.

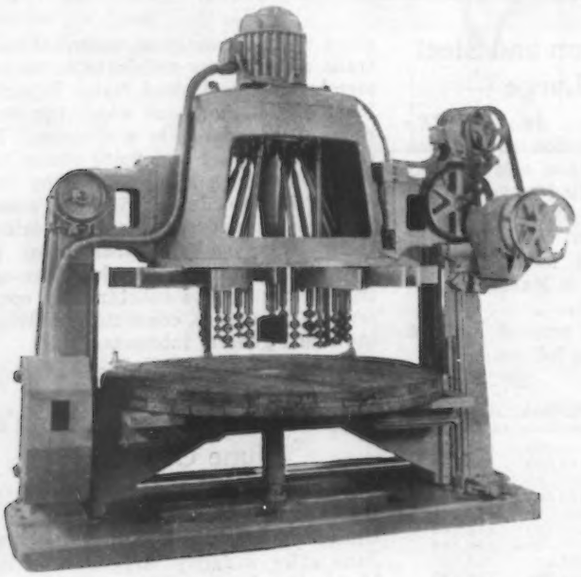
Employment and Payroll Totals in Identical Plants in May and April (a)

	Establishments	Number on Payroll		Weekly Payroll (b)	
		May	April	May	April
Iron and steel.....	204	285,897	282,591	$9,585	$9,487
Foundry and machine shop.....	1,064	283,800	279,347	8,992	8,890
Machine tools.....	150	40,397	40,198	1,350	1,358
Hardware makers.....	68	32,823	32,618	865	852
Steam and hot-water appliances	112	33,199	34,585	982	1,022
Stoves	119	20,838	20,704	594	585
Structural ironwork.....	169	27,890	27,413	847	830
Cast iron pipe.....	41	12,009	11,777	280	275

(a) United States Bureau of Labor Statistics.
(b) Thousands of dollars.

Wooden Cable Reel Heads Bored in One Operation

RUGGED construction, large universally adjustable spindles and powerful feed mechanism are basic features of a vertical multiple-spindle borer developed by the B. M. Root Co., York, Pa., for boring all the holes in the heads of wooden wire and cable reels. Clearance between the upright columns is 74 in., which permits handling reels 72 in. and less in diameter.



ALTHOUGH Designed for Boring Cable Reel Heads, the Machine May Be Used for Boring Other Wooden Pieces

The machine has a heavy one-piece cast base, cored columns and two table supports. The latter have long square-lock gibbed bearing contact on the slideways of the columns, and carry a series of I-beams that provide a bed for attaching the wood top upon which the stock to be bored is mounted. The table is counterweighted to lessen the resistance of the feed works while boring. It drops by gravity when released by the knockout rod, its downward movement being controlled by two friction brakes and a pneumatic plunger. There are two motors, a 5-hp. feed motor mounted with the feed mechanism on the right-hand column, and a 15-hp. vertical spindle-drive motor, which is located on the spindle hood. Push button control is provided, both motors being started and stopped together.

Feed control is by means of a foot trip mounted on the base. When depressed, this trip causes the table to be raised automatically to the boring bits. An adjustable knockout rod releases the feed at any point, permitting the holes to be bored to a predetermined depth.

The spindle hood, attached to the upright columns, carries the spindle drive motor, the gear plate and the gear casing for the spindles. The transmission gears in the top of the case are of helical type and run in grease. All spindles except the center spindle, which is fixed, are of universal type, and are adjustable 6 in. in all directions from vertical. They are bronze bushed and equipped with ball bearings to take end thrust.

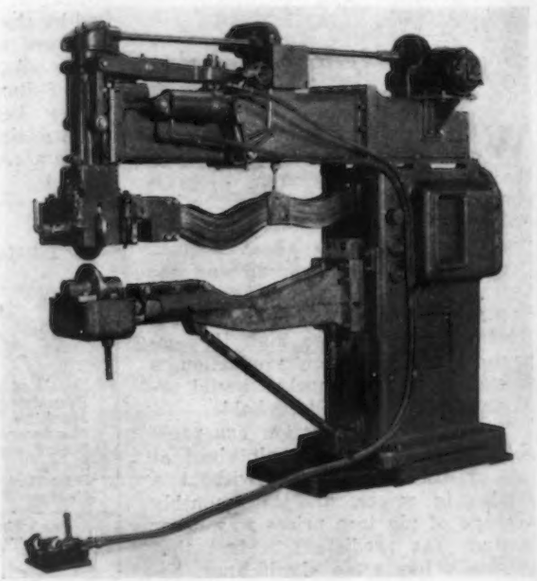
The distance from the spindle noses to the table in lowest position is 16 in. and distance from spindle noses to floor is 44½ in. The wood table measures 53 x 60 in. The height of the machine is 9½ ft. overall, and the floor space occupied is 5 ft. 2 in. by 10 ft. 4 in. The shipping weight is 8000 lb.

Rugged Seam Welder for Continuous Operation

A SEAM welder known as Model 375, capable of making joints 48 in. from the nearest edge, has been developed by Thomson Electric Welding Co., Lynn, Mass. It is rated at 175 kva. and is air operated. Current control is automatic.

The upper roller or electrode is motor driven, as shown in the view; the lower roll idles. These and their bearings are unusually rugged to resist service abuse, yet easily replaced when repairs or dressing is necessary. Rollers are water cooled, and the whole machine is built for heavy-duty operation, 24 hr. a day.

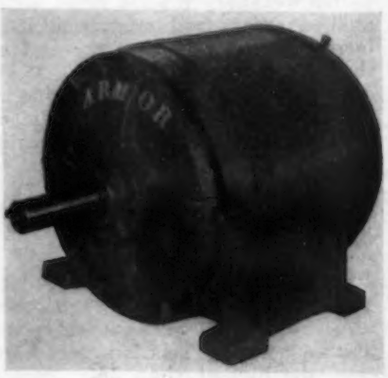
When a different class of work is to be done, the entire lower roll unit can be quickly replaced by another of appropriate design.



FLAT Sheets May Be Welded to Make Continuous Wide Strips. The depth of throat is 48 in. Automatic current control is provided

Abrasion-Proof Induction Motors Offered

A NEW line of inclosed electric motors, in ratings of from ½ to 50 hp., 550, 440 and 220 volts, 2 and 3-phase, 25 and 60 cycles, has been developed by the Armor Electric Mfg. Co., Erie, Pa. The motors are of the squirrel-cage induction type, and are said to be particularly suitable for use under conditions where the atmosphere is likely to be impregnated with explosive fumes or abrasive dust, such as chemical plants, coal mines, foundries or cement plants.



Completely Inclosed, This Motor Is Offered as Proof Against Abrasion or Explosion

The stator is of the skeleton-frame type, the frames being made of especially heavy castings, with the feet cast integral. Rigidity of construction is secured by heavy flanges and cross ribs. The core is made up of

high-silicon steel laminations, keyed to the stator ribs, and having partially closed slots. The core steel has been selected as a means of improving both the power factor and general efficiency of the motors. The windings are of the concentric type, with one phase to the slot. Timken roller bearings are used.

Clamshell Bucket Handles Variety of Material

A POWERFUL digging bucket that can be adjusted for the kind of material being dug has been brought out by the Erie Steel Construction Co., Erie, Pa. It has been named the Multi-Power from its working action, which combines the multiple rope and the lever arm principles. The former provides power, but slows up the action of the bucket, while the lever arm principle gives speed as well as power. It is stated that the combination provides better digging and

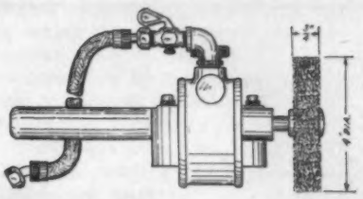
Bucket for Digging or Rehandling. It can be adjusted for kind of material being dug

faster operation and also enables designing a bucket requiring considerably less head room, with less line to overhaul. The bucket can be rigged with from two to six parts of line.

Scoops are made oversize with but little added bucket weight. Counterweights are in 100-lb. units which are attached to the bucket by two bolts and can be put on or taken off conveniently by one man. Stops are of improved design; they are relocated and made longer so that they add reinforcement to the arm. The main bearing has been made wider to better withstand shocks of digging and to eliminate excessive wear. All ropes end in a wedge and socket. Power arm sheaves may have either plain or roller bearings. The sheaves are of steel and are equipped with cleaners. Heavy down-thrust lugs are provided on the bucket scoops to relieve the rivets, the down thrust being on the edge of the bucket, thus forcing the scoops into the materials while closing. Lubrication is by the Alemite system.

Air-Operated Wire Brush

FOR the rapid removal of rust, scale and loose paint from the surface of steel and other materials before painting, the Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, is offering a portable air-operated wire brush cleaner.



Wire Brush Machine Weighing 10 Lb. It is 4½ in. in diameter and 11 in. long

The machine weighs 10 lb., and is 4½ in. in diameter and 11 in. long. It may be equipped with a ¾ x 4 in. or 1 x 6-in. wire wheel. From 8 to 16 cu. ft. free air per minute is required, depending upon the speed of operation, which is regulated by means of an air valve.

Gear Burnisher Arranged for Rapid Operation

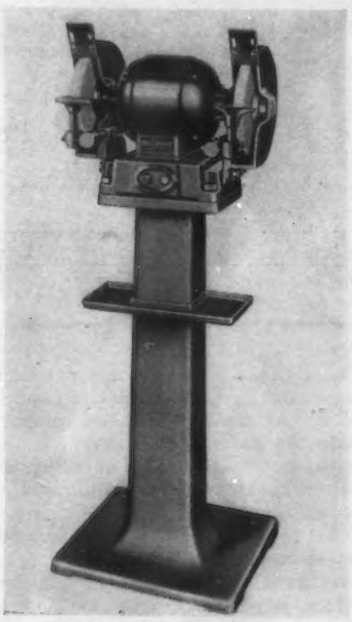
UNIFORMITY of pressure applied to the gears being burnished, minimum of set-up time, and rapid operation are features claimed for the Bolender gear burnishing machine marketed by the City Machine & Tool Works, Dayton, Ohio.

The uniform pressure is obtained by means of an air cylinder and valves which control the movement of a member carrying two burnishing rolls. The pressure applied is registered constantly on a dial gage and can be checked at a glance by the machine operator or foreman. Gears are burnished with their center line vertical, to assure a straight bearing on gears of any weight or length. Gears of various lengths or diameters are accommodated by moving the supporting member upward, downward or sidewise by means of hand knobs shown in the illustration. It is claimed that from 2300 to 3000 gears, 6-8 pitch, 16 to 30 teeth, can be burnished in a 9-hr. day.

From 2300 to 3000 Gears of 16 to 30 Teeth, 6-8 Diametral Pitch Can Be Burnished in 9-Hr. Day

Motor-Driven Grinders with 6 and 8-In. Wheels

NEW motor-driven grinders equipped with 6 and 8-in. wheels have been brought out by the Hill-Curtis Co., Kalamazoo, Mich. Either bench or pedestal mounting can be supplied and the motor may be either alternating or direct current of stand-



Bearings and Motor Are Fully Inclosed

ard specifications. Oversize ball bearings are mounted in the end head in close proximity to the wheels, and all bearings are entirely inclosed to protect them from dust and grit. There are no holes or open slots in the motor housing or end bells, which eliminates danger to the windings from accumulations of emery grit and dust.

Two-pole quick make-and-break switch is standard equipment. Wheel guards and tool rests are adjustable to the wear of the wheels, and can be removed conveniently when the character of the work does not permit their use. Single-phase, alternating current machines are equipped with an improved commutating-type repulsion-induction motor. Low voltage is said to have no objectionable effect, the starting current being unusually low, thereby adapting the machine for attachment to lighting circuit outlets.

Rights to manufacture the oscillating spindle sander, heretofore made by the Emmert Mfg. Co., Waynesboro, Pa., have been acquired by the Porter-Cable Machine Co., Syracuse, N. Y.

Advanced Method of Installing CO_2 Meters

A NEW method of installing CO_2 apparatus, working on the thermal conductivity principle, has been developed by the Brown Instrument Co., Philadelphia. In this system of analyzing gases, the relative capacity of air to conduct heat, as compared with the gas to be analyzed, is used to operate electrical indicating and recording instruments calibrated directly in per cent of CO_2.

In the illustration is shown the latest method of installing this apparatus, eliminating the trouble heretofore experienced due to clogging and gas leaks. A primary filter consisting of perforated metal, supporting asbestos cloth, projects into the flue or furnace. The pipe supporting this primary filter slopes downward from the filter, at 5 to 10 deg., so the moisture is drained off.

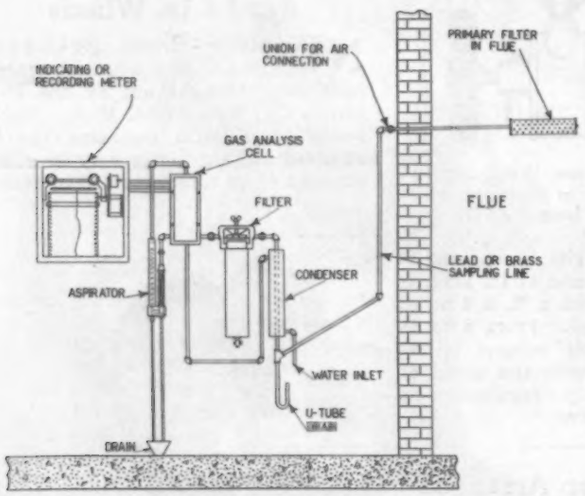
From here the sampling line runs directly down to the U-tube drain, which collects excess moisture and acid. The gas then passes through a condenser, where it is cooled to prevent any accumulation of moisture in the analysis cell.

A union connection is made at the sampling tube so the primary filter can be blown out occasionally. In practice, this blowing out is done infrequently. A secondary filter consisting of a container with steel wool and cotton is placed in the line in front of the cell.

In the thermal conductivity cell are four platinum filaments of comparatively heavy wire, mounted in gold plated cells with gold lined passages. Two of the cells contain air. The other two contain gas to be analyzed, the thermal conductivity of which is to be compared to air.

From the cell, a 5-wire cable runs to indicating or recording instrument calibrated directly in per cent of CO_2. This instrument may be located at a distance, without affecting the time lag.

This new piping arrangement, with improved condenser, filter and cell assembly, is said to mark a substantial advance in the perfection of CO_2 analyzing apparatus operating on the thermal conductivity principle.



New Arrangement for Connecting Up Instruments for Measuring Carbon Dioxide Content of Flue Gases. This is said to provide exceptionally accurate results

Improved Accurate Method of Testing Die Blocks

A SPECIALLY built Brinell machine for the testing of all die blocks has been installed by the Heppenstall Forge & Knife Co., Pittsburgh, manufacturer of Hardtem die blocks, shear knives, electric induction steels, and miscellaneous heavy forgings.

The face surface of each die block is stamped near each Brinell ball impression, showing the diameter in millimeters of this impression. In conjunction with the company's engineers, this machine was built by the Pittsburgh Instrument & Machine Co. The illustration shows the machine in operation.

Die Blocks Being Tested for Brinell Hardness by a Specially Built Machine

Causes of Porosity in Cast Bronzes

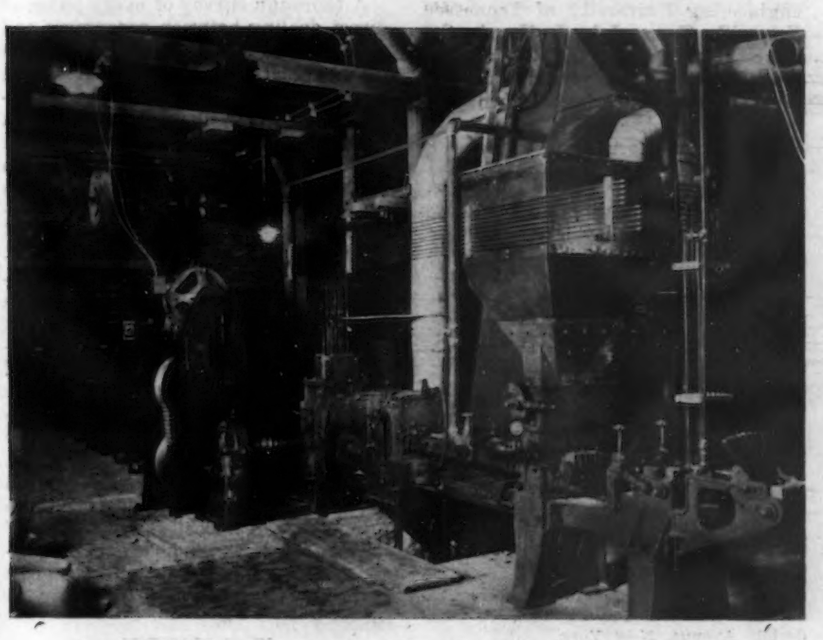
ARGUMENTS which seek to blame the cause of porosity in bronze castings on oxides, gas occlusions, improper mixing or similar secondary matters, without full reference to the volume change on freezing and the freezing range, are likely to be very misleading; these two latter effects are of supreme importance, said H. C. Dews in his paper, "The Metallurgy of Cast Bronzes," before the Third International Foundrymen's Congress in London, June 11 to 14.

There seems to have been a general avoidance in the past of any discussion of such a point of view, and on account of this remission, there is little doubt that research could quickly be guided into channels of profitable incidence on practice.

Cleaning Strip Steel Mechanically

New Machine Obviates Need for Pickling to Remove Scale

A MACHINE has been developed and put into operation for cleaning or removing scale from hot-rolled and annealed strip steel, eliminating the acid pickling process. This was designed and developed by C. A. Dreisbach and his associates of the Standard Equipment Co., Inc., New Haven, Conn. Mr. Dreisbach has designed various types of equipment used by foundries and manufacturing companies for cleaning and removing scale from castings, forgings, heat-treated springs and other articles. Most of these employ the principle of abrasive blasting with compressed air at low and high pressures. He attempted to use the same principle in cleaning cold-rolled steel-strip rod and wire but found that, although the abrasive material would remove the scale, it would at the same time produce pits in the stock. This, of course, was an objectionable feature. It was found by investigation that the depth and size of the pits thus formed varied in relation to the angle of impact.



Scouring Machine Developed to Clean Strip Steel Instead of Pickling

After various tests covering the best kind of abrasive, the angle of impact and the compressed air operating pressure for producing the most effective results in removing scale and producing a pitless smooth surface, Mr. Dreisbach made the experimental machine which was then used for making further tests in cleaning hot-rolled and flat annealed stock up to 1 in. wide and also No. 5 rod and wire. The result was a machine which removed the scale and produced a smooth finish.

Further experiments were necessary to determine the most efficient sizes, designs and combinations of air nozzles, scouring chambers, etc., during which there was produced a combination that increased the linear cleaning feet to a maximum output with the lowest consumption of compressed air, abrasive and wear on the scouring chamber, air nozzles, etc. Finally a complete machine was designed, the parts of which may be removed and replaced in a few minutes, without taking out the strands of stock from the machine. This machine was found to remove scale and oxide from copper alloyed rod at the rate of 50 to 70 ft. per min. Another machine of the same model cleans steel golf shafts at the rate of 6 per min.

A steel company which manufactures high and low-carbon cold-rolled strip steel installed the first model of these automatic scouring machines, shown in the illustration. This machine will take a continuous feed of one or more strips up to 7 in. wide and is cleaning two sides and edges of hot-rolled high-carbon steel at the rate of 35 to 45 ft. per min. and annealed and tempered stock at 40 to 60 ft. per min. in one pass.

The control levers for operating the pulling roll are within easy reach of the supply-stock man at the front end of the machine. Each winding drum, or reel, is provided with a clutch foot-lever control to stop the machine to remove the finished coil and take up and wind new coil coming through. The abrasive, or sand, in the scouring machine is used over and over, and the dust is removed by an exhaust system into a cloth screen dust arrester.

Another machine is now being designed which, it is claimed, will take one or more strands of stock up to 14 in. wide and wider models are contemplated. Other types of scouring machines will also handle wire and rod up to about ½-in. diameter in any number of strands equal to the width or capacity of the scouring chamber. The patents covering these machines are owned by the Standard Equipment Co., Inc.

Builds Ladder with Steel Safety Rungs

STEEL rung safety ladders and steel tread safety platform ladders are now being offered by the Lourie Mfg. Co., 410 Sharples Building, Chicago.

The steel rung safety ladder is made in straight and extension types; also in a combination extension and trestle with quick attaching and parting device for attaching the ladders in trestle formation and for separating them to make an extension. These ladders are equipped with flat surface steel rungs bolted to straight grained spruce side rails, each end of the rung being further reinforced by a penetrating ear which in assembly is embedded in the side rail.

The two points of contact at each end of the rung produce a bracing effect that serves to prevent twisting or weaving. With this system only 5/16-in. holes are required in the side rails instead of the usual 1-in. holes for wooden rungs, and there is no shrinking of rungs, of course. The extension ladders slide rail over rail, permitting ladders to be extended to within one foot of the total length. The ladders may be tightened with a wrench at any time.

Platform ladders are constructed of straight-grained spruce throughout and have a large working platform of ample size for two men. This platform has heavy steel angle supports with an automatic lock which cannot be released until the weight is removed from the ladder, when it can be easily operated with one hand. Steps are supported with steel angle brackets and tied to the side rails with bolts.

An addition to its by-product coke plant at Aliquippa, Pa., will be made for the Jones & Laughlin Steel Corporation by the Koppers Construction Co. The addition will consist of 81 Becker-type ovens with an annual coal carbonizing capacity of 850,000 net tons. Auxiliaries will include additions to by-product, benzol and material handling plants and boiler house. On completion, the plant at Aliquippa will have 203 Becker type ovens with an annual coal capacity of approximately 2,000,000 tons.

Mechanical Engineers' Part in Metal Congress

The iron and steel division of the American Society of Mechanical Engineers, from Sept. 11 to 13, will hold its fall meeting in Cleveland in conjunction with the National Metal Congress. The first session will be on Wednesday afternoon, Sept. 11, with presentation of the following papers:

"Developments in Blast Furnace Design and Practice," by Arthur G. McKee, Cleveland.

"Ore Handling Bridges," by Alexander C. Brown, president Industrial Brownhoist Corporation, Cleveland.

"Oil-Electric Locomotives in Steel Mill Transportation," by W. L. Garrison, assistant manager locomotive department, Ingersoll-Rand Co., New York.

On Wednesday evening there will be a dance and entertainment, and a plant inspection trip will be made Thursday morning. Thursday afternoon there will be a joint session with the American Welding Society, when the program will be as follows:

"Non-Destructive Tests of Welds," by Elmer A. Sperry, president American Society of Mechanical Engineers.

"Foreign Practice in Welding Boiler Tubes and Drums," by George A. Orrok, consulting engineer, New York.

"Automatic Arc Welding of Thin Sheets," by W. L. Warner, industrial heating and welding engineering department, General Electric Co., Schenectady, N. Y.

Friday morning two papers will be read, one on "Alloy Steels in Iron and Steel Mill Equipment," by M. J. R. Morris, Central Alloy Steel Co., Massillon, Ohio; and the other on "Evolution of Drives for Mill Table Rollers," by K. Feller, Schloemann Engineering Co., Pittsburgh.

The final session, held jointly with the American Society for Steel Treating, is scheduled for Friday afternoon, Sept. 13. The program includes the following papers:

"Distribution of Heat in Combustion Furnaces," by M. H. Mawhinney, Electric Furnace Co., Salem, Ohio.

"Advantages of Producer Gas as a Fuel Compared With Other Forms of Fuel," by Victor Windett, Wellman, Seaver, Morgan Co., Cleveland.

"Powered Coal Cupola," by D. H. Meloche, American Radiator Co., New York.

Charles Piez Nominated President of A. S. M. E.

Charles Piez, chairman of the board, Link-Belt Co., Chicago, has been nominated as president of the American Society of Mechanical Engineers and will be elected by letter ballot to take office at the time of the next annual meeting of the society in the first week of December. Nominees for vice-president for a two-year term are Paul Doty, chairman Minnesota State Board of Registration, St. Paul; R. E. Flanders, manager Jones & Lamson Machine Co., Springfield, Vt.; E. L. Jahncke, president and general manager Jahncke Dry Docks, Inc., New Orleans, La., and assistant secretary of the United States Navy; and Conrad Lauer, vice-president Day & Zimmermann, Inc., Philadelphia.

For the three-year term as manager the following have been nominated: Harold V. Coes, Ford, Bacon & Davis, Inc., New York; J. D. Cunningham, president Republic Flow Meters Co., Chicago; and C. F. Hirschfeld, Detroit Edison Co., Detroit.

Representatives of the society to the American Engineering Council for a two-year term will be L. P. Alford, editor *Manufacturing Industries*, New York; Thomas D. Campbell, president Campbell Farming Corporation, Hardin, Mont.; William B. Ferguson, production manager Newport News Shipbuilding & Dry Dock Co., Newport News, Va.; Charles E. Ferris, dean of engineering University of Tennessee, Knoxville, Tenn.; John L. Harrington, Harrington & Cortelyou, Kansas City, Mo.; William H. Kenerson, chairman division of engineering, Brown University, Providence, R. I.; John H. Lawrence, vice-president Thomas E. Murray, Inc., New York; R. C. Marshall, Jr., Sumner Sollitt Co., Chicago; A. A. Potter, dean of engineering schools at Purdue University, LaFayette, Ind.; and Charles Piez, ex-officio.

Advisory Committee for Distribution Census

An advisory committee of business men and economists which will cooperate with the Department of Commerce in formulating plans for taking the first national census of distribution in 1930 has been announced by Secretary of Commerce Robert P. Lamont, as follows:

F. M. Feiker, managing director, Associated Business Papers, Inc., 52 Vanderbilt Avenue, New York.

Dr. F. M. Surface, assistant director, Bureau of Foreign and Domestic Commerce, Washington.

Sydney Anderson, president, Millers' National Federation, Mills Building, Washington.

Dr. L. D. H. Weld, H. K. McKann Co., 285 Madison Avenue, New York.

Dr. Melvin T. Copeland, professor of marketing, Graduate School of Business Administration, Harvard University, Boston.

W. E. Freeland, Freeland & Warren, Inc., Statler Building, Boston.

E. D. Borden, manager, domestic distribution department, Chamber of Commerce of the United States, Washington.

William Nelson Taft, editor, *Retail Ledger*, Philadelphia.

C. J. Whipple, president, Hibbard, Spencer, Bartlett Co., Chicago.

Henry S. Dennison, president, Dennison Mfg. Co., Framingham, Mass.

E. M. West, Dodd & West, 11 West Forty-second Street, New York.

F. A. Gosnell, Brumback Realty Co., 37 Wilson Boulevard, Clarendon, Va.

Paul T. Cherington, J. Walter Thompson Co., 420 Lexington Avenue, New York.

Herbert P. Sheets, managing director, National Retail Hardware Association, Indianapolis.

The first meeting of the committee will be held Wednesday, July 17, at the Department of Commerce in Washington. Secretary Lamont and Dr. Julius Klein, assistant secretary of commerce, will be present at this meeting, in addition to William M. Steuart, director of the census, and Dr. Robert J. McFall, chief statistician for distribution, under whose immediate supervision the census of distribution will be taken.

It is expected that the scope of this first census of distribution will be determined at the meeting of the committee and that plans will be made for securing the cooperation of the business world. Subcommittees may be named to deal with particular phases of the census.

Scrap Institute to Survey "Direct Dealing"

A thorough survey of every phase of direct dealing between consumers and producers of scrap will be undertaken by the Institute of Scrap Iron and Steel, Inc., it was announced by Benjamin Schwartz, director general, at a meeting on July 10 of the Pittsburgh chapter, at the William Penn Hotel, in Pittsburgh. On the recommendation of Mr. Schwartz, the executive committe of the institute, at its last meeting, made an appropriation, authorizing the creation of a research bureau, the first object of which will be to study the subject of direct dealing.

This study will involve the marshalling of an array of economic facts and evidence by an entire industry. The survey, which will be under the supervision of the director general, will be placed at the disposal of consumers, producers and all agencies concerned with the scrap iron industry. The principle of reciprocity, in the sale of finished steel products and the purchase of scrap, and its effect on the steel industry, will also probably be included.

Abrasive Manufacturers' Export Association

The Durex Abrasives Corporation, an association of manufacturers of abrasive materials, has been organized under the Export Trade Act to export abrasive products. Offices will be maintained at 82 Beaver Street, New York. Officers are A. J. Sidford, president; W. L. McKnight, F. J. Tone and D. W. Fernhout, vice-presidents; R. W. Young, treasurer; and L. K. Southard, secretary.

Members of the association are: American Glue Co., Boston; Armour & Co., Chicago; Baeder Adamson Co., Philadelphia; H. H. Barton & Son Co., Philadelphia; United States Sandpaper Co., Williamsport, Pa.; Behr-Manning Corporation, Troy, N. Y.; Carborundum Co., Niagara Falls, N. Y.; Minnesota Mining & Mfg. Co., St. Paul, Minn.; and Wausau Abrasives Co., Wausau, Wis.

Toncan iron, a rust-resisting product of the Central Alloy Steel Corporation, Massillon, Ohio, has been specified for 1000 all-metal box cars recently placed by the Pennsylvania Railroad. Approximately 5000 tons of this steel will be required.

To Make Stainless Steel in Canadian Plant

Stainless steel will be manufactured by a plant at Shawinigan Falls, Quebec, which is now near completion, Assistant Trade Commissioner L. A. France, Montreal, reports to the Department of Commerce.

When completed the new plant will provide for the manufacture of alloy steel castings of all kinds, including stainless heat-resisting steels, corrosion-resisting steels, wear-resisting steels, carbon steels, specially annealed steels and other alloy steels.

The company owning the new plant will be the first in Canada to specialize in the manufacture of such products. Its equipment will include an electric heat-treating furnace and two electric steel furnaces of 1 ton and 2 tons' capacity.

To Locate New Sheet Mill at Tarentum, Pa.

A new company for the rolling of light-gage steel sheets up to 72 in. in width is being organized in the Pittsburgh district, with a mill to be located at Tarentum, Pa. The plant will be located on the site of the No. 2 factory of the Pittsburgh Plate Glass Co. at Tarentum, which was abandoned in 1914, and the company is to be known as the Tarentum Steel Corporation.

Griffith Robinson, industrial engineer, with offices at 1706 First National Bank Building, Pittsburgh, is active in the organization of the new company and will be its president. William Cole, who was identified with the West Penn Steel Co., Brackenridge, Pa., prior to its consolidation with the Allegheny Steel Co. earlier this year, will be works manager of the Tarentum company. He has been associated with the West Penn company for 20 years and previously was with the Seneca Iron & Steel Co., Buffalo, and the Eastern Rolling Mill Co., Baltimore. Virgil McClay, who has also been identified with the West Penn company for several years, most recently as assistant to the president, will also be associated with the new company.

The Tarentum plant will be equipped with a group of six mills and utilize the double-mill system of manufacture. A number of innovations in sheet rolling will be introduced, particularly relating to the handling of material in process and the saving of man power. The mill will have a capacity of 50,000 tons annually, and will employ from 400 to 500 men.

The capitalization will consist of 60,000 shares of preferred stock with a par value of $50 a share, and 100,000 shares of common with no par value. About half the stock is expected to be sold locally at Tarentum.

Scrap Institute to Apply for Revised Freight Rates

The executive committee of the Institute of Scrap Iron and Steel, Inc., has authorized the filing of a petition with the Interstate Commerce Commission for the examination and reconstruction of the entire freight rate structure in the United States on scrap iron and steel. It is expected that this hearing will be made under the Hoch-Smith resolution, as a result of which the freight structure for finished steel products was recently changed to a mileage basis.

In view of the fact that the decision of the Interstate Commerce Commission on finished steel products did not include scrap iron and steel, the Institute of Scrap Iron and Steel has decided to make a test case, in behalf of the entire industry, for the purpose of eliminating inequalities and broadening markets for scrap.

Sheet Steel Pulley Market Growing Rapidly

Fabricators of sheet steel pulleys have developed a market of fast growing proportions, states the current issue of "Making Markets," published by the Sheet Steel Trade Extension Committee. One of the advantages of these pulleys is their smoothness of groove, which minimizes wear on the belt and makes replacement less frequent.

Requests Amendment of Zinc Ore Tariff

WASHINGTON, July 16.—Stephen S. Tuthill, secretary American Zinc Institute, requested the metals subcommittee of the Senate Finance Committee to amend the zinc ore section of the present tariff act as follows: Zinc bearing ores of all kinds, except pyrites, containing not more than 3 per cent zinc, 1½c. per lb. on the zinc contained therein. The exception protects sulphur in pyrites chiefly used in making sulphuric acid, which in turn is essential to the manufacture of superphosphate, the most widely used farm fertilizer.

A PARK for employees' cars has been provided at the Zanesville, Ohio, plant of the American Rolling Mill Co. An oil and gas station stands at the entrance, giving the attendant control over cars entering or leaving. The station is open from 5 a. m. until midnight, thus covering all three turns of the steel workers. Attendants fix tires and grease cars at a nominal price.

Yale & Towne Mfg. Co. Buys Stuebing-Cowan

The Yale & Towne Mfg. Co., Stamford, Conn., has announced the purchase of the assets and good-will of the Stuebing-Cowan Co., Cincinnati, manufacturer of hand lift trucks. James C. Morgan of the Yale & Towne company will have supervision of the Stuebing-Cowan branch of the business. Walter C. Stuebing will be Mr. Morgan's assistant. William Stuebing will remain as superintendent of the plant in Cincinnati, where a large modern addition is being built to take care of the expanding business.

German Steel Exports Remain High

Although less by 30,594 metric tons, exports of iron and steel products from Germany maintained during May the greater part of the tremendous increase accomplished during April, Trade Commissioner James E. Wallis, Jr., Berlin, reports to the Department of Commerce. Trade totaled 534,825 tons in May, whereas during the preceding month it was 565,419 tons, the decrease amounting to approximately 5½ per cent.

German production increased during May, the output of pig iron rising from 1,105,098 tons in April to 1,133,134 tons in May, with comparable figures for steel at 1,414,916 tons and 1,421,047 tons, respectively. Furnaces in blast at the close of the month totaled 102, an increase of three over the number in operation at the end of April.

Reduction in Fuel Briquet Output in 1928

Fuel briquets produced in the United States in 1928 are reported by the Bureau of Mines at 947,423 net tons, valued at $7,705,617, or an average of $8.13 a ton. This represents a reduction from the figures for 1927 and 1926, but otherwise was the highest, both in quantity and value, ever reported. In 1927 there were 970,468 tons, valued at $7,985,165, or an average of $8.23 a ton; in 1926, 995,332 tons, valued at $8,533,179, or an average of $8.57 a ton.

Production is seasonal—October to January, inclusive, are the four big months, accounting for about one-half the year's total. While 1928 showed a loss of 2.4 per cent from 1927 in aggregate output, the Eastern States reported a gain of 16.3 per cent, being offset by heavy declines elsewhere.

General Electric Orders Gained 32 Per Cent

Orders received by the General Electric Co. for the three months ended June 30 amounted to $119,351,248, compared with $90,431,957 for the corresponding quarter of 1928, an increase of 32 per cent, President Gerard Swope has announced. For the six months ended June 30 orders received amounted to $220,716,456, compared with $170,357,797 for the first six months of last year, an increase of 30 per cent.

Truscon Has New Product

The Truscon Steel Co. has announced the manufacture of a new product, Truscon integral door jambs and trim. It combines door frame, bucks, lintels, jamb, casing, door stop, transom bar and transom casing in one piece which can quickly be erected as an integral part of the wall. Details and specifications of this product are set forth in leaflet No. 159, just published by the company.

More Steel Shipbuilding

A greater tonnage of merchant vessels (mainly steel ships) is now under construction in the United States than at any time for two years, according to Lloyd's Register of Shipping. The total is of 119,098 gross register tons, as of June 30, compared with 96,439 tons on March 31. Not since June 30, 1927, when 147,000 tons was on the ways, has so large a volume been reported. Of the present total, 25,200 tons will be propelled by internal combustion engines, mainly of the Diesel type.

The Long Island Machinery Exchange, dealer in new and used machine tools, has leased building at 12-10 Astoria Avenue, Astoria, Long Island.

Advances to Third Rank in Manufacturing

Illinois is now the third manufacturing State in the Union, with a total value of manufactured products in 1927 amounting to $5,386,003,235, an increase of about $383,000,000 over 1923, when Illinois was fourth in industrial work, says a bulletin issued by the Illinois Manufacturers' Association. Some of the 1927 census figures for Illinois, just made public by the United States Census Bureau, are as follows:

Horsepower employed	2,456,997
Agricultural implements produced	$102,206,815
Brass, bronze and other non-ferrous alloys	34,745,584
Car and general construction and repairs, steam railroad shops	101,340,406
Cars, electric and steam railroad, not built in railroad shops	75,585,816
Copper, tin and sheet iron and steel work	19,555,972
Forgings, iron and steel	18,672,992
Foundry and machine shop products, not otherwise specified	245,148,773
Iron and steel, blast furnaces	70,943,000
Iron and steel, steel works and rolling mills	208,563,956
Motor vehicles, not including motor cycles	35,631,587
Printing and publishing, job and book	167,874,087
Printing and publishing, newspaper and periodicals	169,623,924
Slaughtering and meat packing, wholesale	663,054,316
Smelting and refining, non-precious metals	25,543,803
Smelting and refining, zinc	19,696,455
Steam fittings and steam and hot water apparatus	57,608,342
Structural and ornamental iron and steel work	47,826,604
Tin cans and other tinware	49,416,023
Tools, not including edged tools, machine tools, files and saws	13,022,578
Wrought pipe	14,027,121

Although Illinois continues to hold first place in the production of corn, the State, generally speaking, has changed from an agricultural to a manufacturing State. When first admitted to the Union, nine-tenths of the people were engaged in agricultural pursuits, while now not more than one-tenth are employed on the farms.

The center of electricity production in the United States is at a point 3 miles from Urbana, Ill.

The Apollo Steel Co., Apollo, Pa., is installing a new normalizing furnace and other equipment to replace its present facilities, and which will increase production materially. Early in the year the company considered the construction of open-hearth furnaces adjoining its present plant, but that plan was postponed as a result of an assured supply of semi-finished steel. Other plans affecting the company's output, however, are being contemplated, announcement of which will be made in the near future.

The International Tube Cartel has established a central office in Luxemburg, which operates under the name "Office Statistique des Tuyaux en Fonte," and is popularly known as "Ostef."

Production and Shipment of Raw Materials and Finished Products in June

	June, 1929	May, 1929	June, 1928
Trackwork for tee-rail track (a), net tons	14,838	16,333	13,716
Six months ended June 30	85,437	.....	77,129
Electric industrial trucks and tractors (b), shipments	201	211	116
Six months ended June 30	1,103	.....	726
Portland cement produced (c) (d)	16,775	16,151	17,497
Portland cement shipped (c) (d)	18,939	16,706	18,421
Portland cement stocks, end of month (c) (d)	27,433	29,597	25,029

(a) American Iron and Steel Institute.
(b) United States Department of Commerce.
(c) United States Bureau of Mines.
(d) Thousands of barrels.

This Issue in Brief

Welds duralumin sheet or strip by flanging adjoining edges and making a corrugation parallel to the seam, about 2 in. from the weld. This permits expansion and contraction effects to be absorbed.—Page 158.

* * *

Signs of steel overproduction appearing, says Dr. Haney. Output is no longer well balanced with current requirements, according to statistician.—Page 159.

* * *

Don't blame porosity in cast bronzes on oxides, gas occlusions, or improper mixing, without considering volume change on freezing and the freezing range. Foundrymen will mislead themselves if they leave freezing factor out of their calculations.—Page 164.

* * *

Considerable savings result from use of pulverized coal in open-hearth furnaces, compared with oil, natural gas or city gas, says combustion engineer. Clogging of checkers can be prevented by proper preparation of the fuel.—Page 155.

* * *

Determines carbon content of steel simply and quickly by means of the colorimeter method. Equipment required is inexpensive and the test is easy to make. Sample to be tested is compared with sample of known analysis.—Page 158.

* * *

World War placed France in commanding position as far as iron ore resources are concerned, says economist. France gained by conquest half of the largest of the world's ore fields, and another of almost equal size has been developed on her own soil, so she is now first in ore resources in Europe, and perhaps in the world.—Page 154.

Malleable foundry holding fuel-ratio record for the United States melts 3.8 lb. of iron for each pound of pulverized coal. Further reduction of fuel consumption is expected to result from use of furnace waste gases in operating air heaters.—Page 155.

* * *

Aluminum alloy pistons are used in new Wright Whirlwind engines. Pistons are cross-ribbed on the underside of the head and are fitted with full-floating hollow pins, held in place by expanding spring wire locks, to protect the cylinder walls.—Page 150.

* * *

Heat-treating furnace production records are kept for two years. Card record of each lot heat-treated gives furnace number, specification, truck number, order number, quantity, packer's and furnaceman's names, and total time of heat treatment.—Page 145.

* * *

Sharpest building decline since 1925, says economist. Adjusted index based on floor space was 101.1 for June, says Dr. Haney, as compared with 109.7 in May and 130.6 for June, 1928. Value of contemplated new construction is also lower, and building permits have declined considerably.—Page 159.

* * *

Feeds parts through hardening furnace on a continuous metal belt. Speed is regulated from 5 to 20-min. passage through furnace, depending on the size of the part. At discharge end parts fall through air-tight chute into a quenching tank, on to a conveyor, which carries them into tote boxes resting on a roller conveyor.—Page 145.

Leaky iron castings detected by use of microscope. The two main causes of leaks, porous grain and shrinkage cavities, can be readily observed under the microscope.—Page 147.

* * *

Heat-treating specifications for new parts are furnished by research department of cash register plant. Pyrometer operator, heat-treating department and research department, all are given cards containing the specifications.—Page 145.

* * *

Forward buying in steel greater than anticipated, says economist. Unfilled orders do not reflect falling off in current requirements, Dr. Haney thinks, indicating that buying is in excess of needs.—Page 161.

* * *

Recommends that foundrymen use microscope to detect faults in castings. Not simply a laboratory instrument, says metallurgist. Multiplying the power of the human eye by 100, it enables the foundryman to determine quickly the approximate strength, machinability and other properties of his castings. It also helps him ascertain what caused defects.—Page 146.

* * *

Machine tool purchases for July will run about 20 per cent below June, according to reports. Despite the seasonal recession in buying, it is estimated that current business shows a gain of about 20 per cent over July, 1928. —Page 197.

* * *

Chrome - nickel iron sheets, practically impervious to atmospheric corrosion, are used to cover outdoor corridor bridge. These alloy sheets will withstand severe weather conditions without losing their highly polished finish.—Page 158.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Seven Years of Prosperity

IN less than three months we shall have completed a period of seven years of prosperity. There are definite reasons for fixing Oct. 1, 1922, as the date of beginning. The length is unprecedented. Why has the period been so long, and what does it mean?

There has been so much argument about "prosperity"—recalling the vogue two years or so ago of the expression "profitless prosperity"—that the gage we are here using to determine this period should be stated. We take it that to prosper is to get things which one wants. It will be granted that things produced are received by somebody and that production is confined to things which are wanted. In a succinct manner the Federal Reserve Board has presented monthly statistics since 1919 of "industrial production," including manufacturing and mining, the index numbers being weighted for seasonal variation. The computations are of course made purely on a quantity basis, with no reference to market value. The index of industrial production is therefore an index to "prosperity."

Fittingly the base period selected is the average of 1923-4-5, a very fair standard. Entirely failing to secure a prosperity rating are the years 1919, 1920 and 1921, for they showed only 83, 87 and 67 respectively. In 1922 there was a slow climb to 88 in September, whereupon there was a jump to 94 for October. That is when prosperity began. The month was entitled to be six points below the standard, as an annual increment must be allowed for the growth of the country.

There have been only short lulls in this general period of seven years of prosperity. The first lasted a few months, centering in July, 1924, and political uncertainties were chiefly responsible for it. For the second half of 1927 there was a mild lapse, much less pronounced than that in steel production, which had rather a poor half year.

No previous period of prosperity was anything like so long. After the Civil War came eight years of activity, but there were pronounced bad spells, and when the period ended with the panic of Sept. 19, 1873, it was found that much of the supposed wealth was in uncollectible promissory notes and a good deal of the physical property that had been created could not be employed. Afterward the longest period was the three years ended in October, 1907.

What has been called "true prosperity" has been defined as that which carries within it the means of its perpetuation. There lies the distinction between the older periods and the present one. Many commentators in recent years have referred to what they considered an anomaly, that apparently we had prosperity, but prices did not rise. Whatever goes up must come down. The most important thing a business man then had to know was when to "get on" and when to "get off." To misjudge by a few months was fatal.

With steady prices we have had the prosperity that can perpetuate itself, instead of that which brings about its dissolution. The latter sort was marked by the vicious spiral. Wages and prices rose, an advance in either bringing about a rise in the other. Advances in cruder materials were passed on with increments in more finished products. That was the ascending spiral and then came a corresponding descent. The faster the movement up the sooner it was over.

Things are done so quickly nowadays that if our prosperity had been according to the former fashion we should have had a shortening rather than a lengthening of the old-time period. The present period will end under the accumulated weight of our indiscretions, but the buoying forces promise to be in the ascendant for a considerable time longer.

Servants of the Public

HENRY FORD is now a very different man from him who financed a peace ship during the war, and expressed numerous economic vagaries. Even in his business administration his views have changed. No longer is he trying to manufacture all sorts of articles, and recently he became willing to part with his railroad.

In a recent interview he expressed himself favorably on the "formation of a nation-wide power monopoly as the best means of reducing the rigors of human toil and giving cheap light and power to the people." He asserted that all talk about exploitation by industrial combinations for private profit is of no importance, "the important thing being what the nation as a whole gets as the result of the economic and technical advantages of such combinations."

This evinces good sense. The telephone and telegraph companies, the light and power companies and the public service corporations generally (including the railroads) have given the people many enjoyments. Monopoly by them is the last thing in the world to be feared; for what they want naturally is to increase their business and not to strangle it.

Anyway, these corporations, as well as all other corporations, are mainly owned by the public, who as shareholders in them are reckoned by millions. The politicians who consider it good business for them-

selves to hit a corporation on the head whenever they see it, and who gravely organize investigations of power trusts and other mythical monsters, are behind the times. But politicians are never very good at their own business in a big way, their expertness seldom rising above petty chicane.

The chief differences between the American system of corporate management and the Russian system of state management are that the former is intelligent and efficient, while the latter is just the opposite; and that participation in the fruits of corporate management is reserved for thrifty people, while state control aims to take care of the unthrifty, in which, of course, it fails by virtue of its own ignorance and inefficiency, and consequently absence of means.

The American system makes managers servants of the public. It commands them to improve efficiency, reduce costs for the benefit of the public and surrender in income taxes a large portion of such personal salaries or profits as may accrue to them. It permits them to play golf, and in other ways to enjoy themselves, in order that their efficiency may be increased. In the end there is the inheritance tax as the final leveler.

These servants of the public may sometimes think of themselves as slaves, and may squirm at times. But they have become inoculated with the virus of working for the sake of accomplishment and are seldom able to quit. The myriads of people who live in good houses and have plenty of fuel, food and clothing; who ride around over good roads in 25 million automobiles; who live in well regulated communities, and who have a wide range of intriguing amusements, must agree that the American capitalistic system is better socialism than any the socialists themselves have ever been able to invent, seeing that the main results of the latter have been hunger, cold and general misery.

Human Side of High Productivity

AN analysis of employment in the Worcester, Mass., works of the American Steel & Wire Co., comparing the years 1920 and 1928, shows an extraordinary improvement in two of the most vital factors, labor turnover and absenteeism. In both respects the percentages of 1920 represented large unnecessary production costs. At the North works, for instance, it was necessary in 1920 to hire 2231 men in order to maintain a working force of 2500. Last year only 382 men were hired to maintain a force of 2000, and the actual turnover caused by the drift of workers in and out was reckoned as about 200, the remaining 182 representing the normal and unavoidable changes resulting from death, disability or retirement. Thus, where the turnover in 1920 was nearly 90 per cent, that of 1928 was about 10 per cent.

In the same works in 1920 absenteeism ran between 5 and 6 per cent. In 1928 it was little more than 1 per cent. In the one year 150 employees on an average were away from their tasks, in the other year the number was less than 25. In considering this and similar statistics, some correction should be made because 1920 was a peak year and 1928 only an average year. But at Worcester the first half of 1929, with increased plant activities, has shown little if any change in the attitude of workers toward their jobs. Neither turnover nor absenteeism has increased to an appreciable extent.

Taking up the slack of industrial unemployment, which has been in progress during the first half of 1929, signifies much more in the increase of production than ever before under like general conditions. For the worker's average output is much more than it used to be, partly because he is working more steadily and is not nearly so prone to shift his employment, but in a larger measure because owners have steadily continued the introduction of better equipment and methods. In the Worcester works, for example—and it is typical—it is found that the output of the 4500 men now on the payroll equals that of 1920, when the same plants were operating with over 6000 men.

A like change for the better is to be found in most lines of successful manufacture. As one plant manager who went through the experience has put it, the initial stimulus came in the war, when the urgent, menacing need for munitions gave industry a kick so vigorous that managements were fairly catapulted into action. The pressure for large-scale operation has continued through the intervening years until in many cases production per man-hour has increased to a degree that is nothing short of revolutionary.

Americanizing Industry Abroad

NOW that Ford automobile factories are being opened in Europe, we may expect the extension there of American mass production, whether or not there is emulation of the Ford practice of paying high wages. Obviously the real significance of the Ford colonization is in the extent to which it will implant in Europe the idea of intensive manufacture and the Ford demand for full output from the worker. The system grants wages as high as possible for results obtained. With it, thinking in terms of the buying power of the individual and fostering broad and sustained consumption is basic. When the principle is adopted by numerous industries, the better economic status of the wage earner is a corollary to high mechanization of the plant.

Only a little while ago the first signs of oncoming depression in the United States were commonly met with plans to reduce wages as the first move in getting lower costs. Talk of sustaining buying power by sustaining wages rarely entered into plans for the continued well-being of a given industry. Now the pay envelope is the very last resort in retrenchment, and since the war wage reductions have been almost wholly limited to industries known to be in a bad way.

In Europe on the other hand the old idea still prevails that wages must closely fluctuate with the tides of business volume and this view obtains widely because neither employer nor employee has yet conceived of the wage as dependent upon output. Europe still awaits the outstanding manufacturer who is daring and far-seeing and financially strong enough to put the new doctrine into practice.

Four years ago two talented young Britons, after widely touring the United States, returned home to write the book much read by industrialists on both sides of the water, "The Secret of High Wages."

Their most important conclusions were compressed into these two paragraphs:

> The very life of this country [Great Britain] depends on two things: deliberate adoption by employers of a policy of high wages, and intelligent understanding on the part of the men that every mechanical aid to efficiency must be used to the utmost.
>
> The organization of cheaper production on American lines must be accepted and restrictions on individual output must be swept away.

Our manufacturers would file no caveat against such European imitation of American production methods as is thus forcefully urged upon British industry. They realize that international trade relations would only be bettered were European manufacturers to follow Henry Ford in the effort to increase per capita consumption through efficient production, high wages, high demand, reduced manufacturing costs, lower prices, sustained worker earnings, continued demand—and so repeating around the circle. By that route more can be accomplished for rational competition in world trade and for higher standards of living than by all the protests that can be piled up at Washington against American tariffs, present or proposed.

Large Gain in Alloy Steels

THAT the American alloy steel industry has been making rapid strides is common knowledge. But no such increase in production as took place in 1928 was expected. The American Iron and Steel Institute reports 3,214,909 gross tons of alloy steel ingots and castings for last year, an increase of 683,100 tons or 27 per cent over the output of 1927. The latter year gained but 2.8 per cent over 1926, and in 1926, which was a large steel year, only 1.25 per cent more alloy steel was made than in 1925.

Undoubtedly an important factor in last year's increase was the use of large tonnages of rustless iron by synthetic nitric acid plants. Recent articles in THE IRON AGE have given details. The announcement last week concerning the employment of rustless iron for the roof and trimmings of the new 64-story Chrysler Building in New York points to a considerable development also in construction. The larger consumption in the motor industry is well known, as is that in aviation. It is to be noted that medium-manganese steel —1.00 to 1.75 per cent—is not included in the production figures. Such steel, for rails at least, is not now statistically classified as an alloy steel, though it well might be.

German Study of High-Frequency Steel Furnaces

SYSTEMATIC investigation of the metallurgy of the high-frequency induction furnace has been in progress at the Kaiser Wilhelm Institute für Eisenforschung in Düsseldorf, Germany, since 1926. The main objects of study are discussed in *Stahl und Eisen*, of May 9, 1929, by H. Neuhauss.

Larger Furnace Means Lower Power Per Ton Need

Increasing the size of the furnace results in pronounced decrease in power for melting. Thus, with a furnace of about 100 lb. capacity, between 1250 and 1300 kwhr. per ton are required when melting scrap. By going to the 600-lb. furnace, this figure can be reduced to about 700 kwhr. Indications are that a 1-ton furnace will compare favorably in power consumption with the latest types of arc furnaces.

The present usage in high-frequency melting resembles crucible practice in that no attempt is made to refine the charge, a high quality of raw materials being used. Two plants using this process for high-quality steel are Edgar Allen & Co., Sheffield, England, and the Heppenstall Forge & Knife Co., Pittsburgh.

Advantageous for Low-Carbon Steels

There are, however, several possibilities for refining operations where the "iron-less" induction furnace may be used most efficiently. One of these is the production of low-carbon steels such as Armco iron or Toncan metal. So rapid is the refining action that it is possible to desulphurize in an acid-lined furnace using a lime-fluorspar-ferrosilicon slag. On experimental 120-lb. melts, this slag was left on the bath for 3 min., giving a final sulphur content of 0.010 per cent. This is followed by a thick sand slag with addition of aluminum and manganese. Several minutes are then allowed for the inclusions to be eliminated. Meanwhile re-oxidation is prevented by blowing nitrogen on the slag. The metal is poured without further additions and has the following average analysis:

Carbon—0.02 per cent.
Manganese—0.04 to 0.10 per cent.
Silicon—0.1 to 0.3 per cent.
Sulphur—0.01 per cent.
Aluminum—Trace.

It is not in the least red-short and can be rolled into perfect seamless tubes. Such materials, due to extreme freedom from inclusions, would be exceptionally resistant to corrosion.

Duplexing With the Cupola

Another possibility is a combination with a cupola melting steel scrap and charging liquid pig iron into the induction furnace. Since the carbon content of the liquid iron can be rapidly lowered in the induction furnace, a means is offered whereby gray iron plants could produce simultaneously small steel castings. Experimentally 12 lb. of pig iron (3.25 per cent carbon) have been decarburized (to 0.04 per cent carbon) in 18 min. by means of a stream of hot air directed on the bath. The duplex process may also be useful in regions where no iron is produced, but where scrap is available.

Perhaps of more direct interest is the use of the induction furnace in making stainless steels. The following methods have been used:

Alloying low-carbon steel with low-carbon ferrochrome.

Decarburizing high-carbon ferrochrome in the induction furnace and adding to fluid low-carbon steel.

Alloying low-carbon steel with cheap, high-carbon ferrochrome and decarburizing the melt.

Production of a 15 per cent Cr pig iron in the induction furnace directly from chrome and iron ores, and decarburizing this iron to give a low-carbon stainless chrome-iron.

In decarburizing the chrome-iron alloys, the high-frequency furnace seems to offer definite advantages. Among these are the ability to reach a very high temperature, thus preventing loss of chromium, and the constant stirring action which results in very rapid refining.

To Use Rustless Iron in Chrysler Building

What appears to be first use on a large scale of rustless iron in building construction is noted in the case of the new Chrysler Building at Forty-second Street and Lexington Avenue, New York. There are several types of rustless iron sold under different trade names, but in general it is a low-carbon, alloy steel containing either a high percentage of chromium or a high percentage of chromium and nickel. The particular brand to be used in this building is stated to be Nirosta, which contains about 18 per cent chromium and 8 per cent nickel, with a carbon content of 0.10 per cent or less. The companies producing this material include Central Alloy Steel Corporation, Crucible Steel Co. of America, and the Ludlum Steel Co.

Rustless iron is to be incorporated in the dome of the building. The height of the dome itself is equivalent to about five stories. On several floors the doors and trimmings are to be made of rustless iron and it is pointed out that this is eminently suitable for this use because it can be given a velvety finish. On the outside of the building all the louvers, or ventilators, are to be made of this same rust-resisting material.

The metallurgists of the companies making this particular brand of rustless iron have cooperated with the metallurgists of the research laboratory of the Chrysler Motor Corporation in the selection of forms and finishes in which the rustless iron is to be used.

Metal Roofdecks Are Stocked in Detroit Warehouses

The Gemfire Steel Co. and the Truscon Steel Co., Youngstown, Ohio, have begun stocking sections of Armco ingot iron roofs in standardized lengths of 19½ ft. in Detroit warehouses to serve users in adjacent territory quickly. The roofdecks come in narrow sections which can be used in any desired lengths. Other warehouse stocks of metal roofdecks will be established by these companies in large cities throughout the country.

Oil Burner Company Makes Changes

Leod D. Becker, owner and publisher of *Fuel Oil Journal*, and a pioneer in the oil burner industry, having disposed of his publishing interests, has been elected president of Electrol, Inc., St. Louis, manufacturer of oil burners. Executive and sales offices will be moved to 227 East Forty-fifth Street, New York. W. T. Koken, who has been president of Electrol since 1925, becomes chairman of the board. M. E. Simpson, formerly general manager of the Electrol Distributing Corporation, which has been merged with Electrol, becomes vice-president in charge of sales. Lionel L. Jacobs continues as vice-president and general manager of the company. Han A. Kunitz, formerly technologist of the American Oil Burner Association, has been appointed chief of research engineering. Lewis L. Scott, inventor of the original Electrol burner, who is a vice-president, continues as general consultant on patents and engineering. The officers, with W. L. Bechtold, of G. H. Walker & Co., St. Louis investment bankers, and W. R. Bush, New York, constitute the directorate.

Manganese Ore Output Small in 1928

There has been little change in the rate of production and shipments of manganese ore, containing 35 per cent and more of manganese, in the United States, in the past three years, according to the United States Bureau of Mines. In 1928, 46,636 gross tons, valued at $1,212,679, was shipped, compared with 44,741 tons, valued at $1,151,918 in 1927, and 46,258 tons, valued at $1,228,663, in 1926. In 1928, 15,430 tons was chemical ore and 31,206 tons, metallurgical ore, compared with 17,011 tons of chemical ore and 27,730 tons of metallurgical ore in 1927, and with 19,728 tons of chemical ore and 26,530 tons of metallurgical ore in 1926.

It will be noted that there has been a falling off of approximately 2000 tons a year in the shipments of chemical ore during this period, which is a continuation of the decline from the peak of shipments, 24,637 tons in 1924. Shipments of metallurgical ore were 3500 and 4700 tons higher, respectively, than the shipments in 1927 and 1926.

Shipments of metallurgical ore from Montana were 12,044 tons in 1928, compared with 10,124 tons in 1927. The plant owned by the Domestic Manganese & Development Co. was put into operation during March and treated rhodochrosite from the Emma mine at Butte, Mont., operated by the Anaconda Copper Mining Co. It produced 11,118 tons of calcined and nodulized material containing 56.45 per cent of manganese. In 1927 the larger part of the metallurgical ore shipped from Montana was from mines at Philipsburg. High-grade shipments from New Mexico and Virginia increased somewhat and those from Nevada dropped off entirely.

Imports of manganese ore in 1928 totaled 427,708 tons, containing 207,808 tons of manganese, and valued at $5,395,949, compared with 622,067 tons, containing 308,630 tons of manganese, and valued at $8,487,016. There were large decreases in imports from all of the important producing countries.

Domestic shipments of ferromanganese in 1928 were 310,122 tons, the largest on record, with the exception of those for 1926, and indicated a consumption of approximately 620,000 tons of manganese ore. The domestic production of manganese ore has changed little in the past three years. Assuming that the metallurgical manganese ore produced in the United States in 1928 offset the ore imported for chemical uses, the total quantity of ore imported, 428,000 tons, was available for consumption in the manufacture of ferromanganese. This tonnage is 192,000 tons less than that required by the manufacturers of ferromanganese in 1928. The difference is explained largely by the decrease in stocks in bonded warehouse, officially reported as 183,477 tons of manganese content on December 31, 1927, and 114,497 tons on December 31, 1928, a difference of 68,980 tons of manganese content, equivalent to at least 138,000 tons of ore. The remainder of the ore required, approximately 55,000 tons, may have been taken from stocks at the plants of consuming companies.

British Foreign Trade in Iron and Steel Products

(*In Gross Tons*)

Item	Imports		Exports	
	May	June	May	June
Pig iron and ferroalloys	7,637	11,376	68,141	40,884
Ingots, blooms, billets and slabs	97,244	85,670	2,615	1,395
Iron bars, rods, angles	17,442	15,358	3,293	1,932
Steel bars, rods, angles	46,182	41,205	29,934	22,522
Structural steel	9,417	9,614	6,119	5,254
Hoops and strips	17,754	18,064	4,867	4,236
Plates and sheets	19,311	17,922	50,581	40,667
Galvanized sheets	....	....	71,723	43,531
Tin Plate	....	....	57,684	48,715
Cast tubes, pipe and fittings	3,910	2,909	12,330	6,151
Wrought tubes, pipe and fittings	8,915	6,639	33,173	22,783
Rails	1,093	868	32,342	22,714
Other railroad material	538	392	13,897	10,216
Wire	7,134	7,071	8,209	5,619
Wire cable and rope	....	....	2,501	1,608
Wire nails, including staples	6,474	5,448	260	145
Other wire manufactures	843	773	1,808	1,565
Nails, tacks, rivets and washers	1,364	1,377	1,919	1,332
Bolts, nuts, screws for metal	1,165	1,002	3,126	1,818
Iron and steel castings	1,388	1,361	352	193
Iron and steel forgings	707	461	124	112
Other manufactures of iron and steel	8,738	6,698	37,776	23,455
Total	257,256	234,208	442,774	306,847

From cablegram of William L. Cooper, commercial attaché, London, to the United States Department of Commerce.

Iron and Steel Markets

Deliveries Easier on Some Products

Common Sheets and Cold-Rolled Strip in Supply at Slight Price Concessions—Two Gas Lines Will Take 440,000 Tons of Pipe—Southern Pig Iron Weaker

NEW projects that will take large tonnages of steel continue to come into the market, offsetting the slight falling off in consumption in some manufacturing lines.

Gas pipe lines, building construction and railroad requirements figure prominently in actual and prospective business.

Evidence also of a stepping up in demands from the automobile industry comes in the form of requests for increased shipments to begin Aug. 1 from companies which had cut schedules preparatory to bringing out new models.

Farm machinery manufacturers, in estimating their steel requirements for the next three months, are planning for a high rate of output. Manufacturers of steam shovels and other road-building equipment are taking steel in undiminished quantities.

Notwithstanding the reduced volume of buying of some steel products, notably cold-rolled strip and some grades of sheets, on which production has caught up with the demand, the steel industry as a whole has felt no marked curtailment in general consumption.

The United States Steel Corporation subsidiaries are working virtually at capacity, and this is true also of most of the independent companies. Taking into account the slight losses in output due to heat and shutdowns for necessary repairs to equipment, present production is probably not five points below the 99 per cent operating rate of recent months.

The small loss in the unfilled tonnage of the Steel Corporation, as of June 30, gave evidence of the fact that the volume of buying last month kept close to the heavy shipments. The June decrease of 47,257 tons was less than one day's output.

Lessening of the extreme pressure for some lines of steel, while not materially reducing the total output, has made it easier for steel companies to arrange mill schedules, and better deliveries to consumers have resulted. A further effect is the relieving of the scarcity of semi-finished steel, which is now adequate to meet the needs, although mills have had little opportunity to replenish the reserves which have been used up in recent months.

Gas pipe lines, which so far this year have taken about 600,000 tons of steel, will provide further large orders. The line from the Texas Panhandle to Chicago, to be built by the Central States Natural Gas Co., requires 191,000 tons, most of which the Milwaukee fabricator of electrically welded pipe is expected to furnish. Another gas line from the Southwest into the Chicago district for Henry L. Doherty & Co., New York, calls for 250,000 tons, soon to be awarded. A group of public utility companies has been formed to lay a total of probably 1000 miles of pipe lines into Pennsylvania, New Jersey and New York.

In steel building construction fresh projects call for more than 74,000 tons, the largest amount reported in any one week this year. Included are 15,000 tons for a bridge at McKees Rocks, Pa., 18,000 tons for two buildings in Chicago and 8300 tons for subways in New York. Awards amounted to 26,000 tons. In Chicago, 40,000 tons of structural steel work is soon to be placed, not figuring the large tonnages for the mill buildings to be erected by the Illinois Steel Co.

Railroad buying has been chiefly in track material. The Great Northern bought 30,000 tons of rails and its orders for accessories will amount to 10,000 tons. The Northern Pacific and the Pennsylvania roads are expected to take 15,000 tons of rails each, and the latter will also buy 5000 tons of track supplies. The Norfolk & Western, following its orders for 39,000 tons of rails, will need 3500 tons of track supplies. Railroad buying of bridges and repair material has also been fairly large.

In the lines of steel in which buying has let down slight price weakness has developed. This has taken the form chiefly of giving the minimum quotations to a larger circle of buyers. Blue annealed sheets have now been affected along with black and galvanized, but full finished and specialty sheets are well sold up and quotations remain steady. Some makers of cold-rolled strip steel need orders, which are being freely taken at 2.75c., Pittsburgh, the premium of $2 a ton for small lots being waived in instances.

Active third-quarter buying has failed to develop in pig iron. Aggressive selling by Southern furnaces, which have heavy stocks of iron, has made Northern buyers more cautious. A few large sales of Southern iron have been made at $14, Birmingham, notably one of 15,000 tons to a Louisville melter. Southern basic iron has been offered at $13.50, furnace. Northern pig iron prices remain steady except in New England, where competition not directly attributable to the Southern situation has caused some unsettlement. Jackson County silvery iron has declined $1 a ton.

THE IRON AGE composite price of finished steel remains unchanged at 2.412c. a lb. for the sixteenth week, while the pig iron composite has dropped for the third time in six weeks, and is now $18.42, a decline from $18.54 last week. The year's high was $18.71 in May.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	July 16, 1929	July 9, 1929	June 18, 1929	July 17, 1928
No. 2 fdy., Philadelphia	$21.76	$21.76	$21.76	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	16.75
No. 2 Southern, Cin'ti	17.69	18.19	18.69	19.19
No. 2, Birmingham	14.50	14.50	15.00	15.50
No. 2 foundry, Chicago*	20.00	20.00	20.00	17.50
Basic, del'd eastern Pa.	20.25	20.25	20.25	19.00
Basic, Valley furnace	18.50	18.50	18.50	16.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	18.76
Malleable, Chicago*	20.00	20.00	20.00	17.50
Malleable, Valley	19.00	19.00	19.00	17.00
Gray forge, Pittsburgh	19.76	19.76	19.76	18.01
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	105.00
Rails, Billets, Etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	35.00	35.00	35.00	32.00
Sheet bars, Pittsburgh	35.00	35.00	35.00	32.00
Slabs, Pittsburgh	35.00	35.00	35.00	32.00
Forging billets, Pittsburgh	40.00	40.00	40.00	38.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.85
Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.95	1.95	1.95	1.85
Bars, Chicago	2.05	2.05	2.05	2.00
Bars, Cleveland	1.95	1.95	1.95	1.85
Bars, New York	2.29	2.29	2.29	2.19
Tank plates, Pittsburgh	1.95	1.95	1.95	1.85
Tank plates, Chicago	2.05	2.05	2.05	2.00
Tank plates, New York	2.22½	2.22½	2.22½	2.17½
Structural shapes, Pittsburgh	1.95	1.95	1.95	1.85
Structural shapes, Chicago	2.05	2.05	2.05	2.00
Structural shapes, New York	2.19½	2.19½	2.19½	2.14½
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.10
Hot-rolled strips, Pittsburgh	1.90	1.90	1.90	1.75
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel, *Per Lb. to Large Buyers:*	July 16, 1929 Cents	July 9, 1929 Cents	June 18, 1929 Cents	July 17, 1928 Cents
Sheets, black, No. 24, P'gh	2.85	2.85	2.85	2.60
Sheets, black, No. 24, Chicago dist. mill	3.05	3.05	3.05	2.75
Sheets, galv., No. 24, P'gh	3.60	3.60	3.60	3.50
Sheets, galv., No. 24, Chicago dist. mill	3.80	3.80	3.80	3.60
Sheets, blue, No. 13, P'gh	2.35	2.35	2.35	2.10
Sheets, blue, No. 13, Chicago dist. mill	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., Pittsburgh	3.30	3.30	3.30	3.20
Barbed wire, galv., Chicago dist. mill	3.35	3.35	3.35	3.25
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$18.50	$18.50	$18.25	$14.00
Heavy melting steel, Phila	16.50	16.50	16.00	13.00
Heavy melting steel, Ch'go	14.75	14.75	15.00	12.25
Carwheels, Chicago	14.00	14.00	14.25	12.75
Carwheels, Philadelphia	16.50	16.50	16.00	15.50
No. 1 cast, Pittsburgh	15.50	15.50	15.50	14.25
No. 1 cast, Philadelphia	16.50	16.50	16.50	15.50
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	13.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	13.50
No. 1 RR. wrot., Ch'go (net)	13.50	13.50	13.50	10.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.60
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	18.12½	18.12½	18.12½	14.75
Electrolytic copper, refinery	17.75	17.75	17.75	14.50
Tin (Straits), New York	47.25	45.12½	44.62½	47.25
Zinc, East St. Louis	6.70	6.70	6.65	6.20
Zinc, New York	7.05	7.05	7.00	6.55
Lead, St. Louis	6.55	6.70	6.80	6.05
Lead, New York	6.75	6.90	7.00	6.20
Antimony (Asiatic), N. Y.	8.25	8.50	9.00	9.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Production Held Close to Full Capacity—Some Slight Declines in Demand With Little Price Weakness

PITTSBURGH, July 16.—With July half gone, Pittsburgh district steel makers have yet to feel any marked curtailment in the general demand for their products. Specifications on some lines have declined much more rapidly than production during the last two weeks, but a leading maker of sheets reports the heaviest specifications since early April and tonnage releases on plates, wire and pipe are fully equal to performance during the corresponding period of June.

Hot weather is now the principal factor in the curtailment of operations, although occasional interruptions are required for repairs to overworked equipment. The larger companies in this and nearby districts are still operating at close to physical capacity, but the actual production of steel is probably 5 points below the peak rate of the spring months. Producers hesitate to curtail in their blast furnace or coke oven departments, and there is a growing belief in the market that the full resources of the industry will again be taxed by heavy fall demand.

Increased August specifications from the automobile industry, although not widely scattered enough to be considered general, indicate a renewed call for steel from that consuming channel. Large pipe line projects are being figured and the oil industry seems to be showing slightly more interest in drilling materials as well as tankage facilities. Barge buying, while temporarily dormant, promises to be renewed as soon as builders have lessened present heavy commitments.

In the immediate Pittsburgh district extensive highway and bridge construction is taking heavy steel tonnage and a bridge across the Ohio River, for which plans are being prepared, will require about 15,000 tons of structural shapes. Railroad car builders in this district will be busy for several months on present work and have shared in recent orders.

Tin plate demand seems to have passed the doubtful status of 30 days ago and recent specifications have been generally satisfactory.

The steel price structure has reflected little weakness as demand for some products has declined slightly. On semi-finished steel, ruling quotations are somewhat in doubt, because of the hesitancy of large consumers to pay the advance on billets and slabs which mills are asking over second-quarter contract prices. Weakness in wire nail prices in nearby districts has not been carried into the Pittsburgh area, and occasionally reported concessions on steel bars and cold-rolled strip have not reached recognizable proportions. Softness continues in galvanized sheets, but many large mills are so well supplied with tonnage that they are not forced to compete for low-priced business in order to maintain satisfactory operations.

Active future buying has failed to develop in the pig iron market, but shipments are holding up fairly well and there is considerable small-lot purchasing at full quoted prices. A stronger undertone continues in scrap despite the absence of large purchases by the mills.

Pig Iron.—A large tonnage of third-quarter iron remains to be bought in this and the Valley districts, although a number of users, particularly of the basic grade, have quietly closed on their immediate requirements. The market is lacking in large inquiries, no new ones having been reported since last week. The Westinghouse Electric & Mfg. Co. has yet to close against the requirements of its Trafford City, Pa., plant. Shipments are holding up fairly well and there is a steady run of new buying in one and two carload lots. In such transactions the regularly quoted prices are being strictly adhered to, and under present conditions no immediate weakening seems likely. The Claire furnace at Sharpsville, Pa., is expected to go out for relining and repairs within a short time, leaving only four strictly merchant stacks operating in the Valley. This is a reduction of two furnaces since spring, and the blowing in of the Neville Island Furnace in the Pittsburgh district will only partly offset the resultant reduction in available merchant tonnage. Merchant furnace stocks are very low, and with one Valley furnace sold up until October, the present market situation seems to favor the sellers. Steel company stocks are also low and steel operations in the Pittsburgh and Valley districts leave little for outside sales. Freight rates prevent the entrance of Southern iron into this and the Valley districts, but considerable interest was aroused by the recent purchase of 15,000 tons of Southern foundry iron by a Louisville, Ky., sanitary ware maker at $14, Birmingham.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—The supply of semi-finished steel in this and nearby districts is now entirely adequate to meet local demand, but non-integrated companies report occasional difficulty in securing tonnages in addition to the regular allotments. Mills have had little opportunity to build up reserve supplies of crude steel and the close adjustment of supply to demand was well illustrated during the Fourth of July week, when curtailment of open-hearth production forced many companies to cut down the operating rates of their finishing mills. In many cases open-hearth furnaces are down for repairs from time to time, and, although steel production in the district may still be said to be close to physical capacity, the actual rate is considerably below that of earlier months. Prices are still rather unsettled, notably on billets and slabs. Sheet bar contracts for this quarter have generally been closed at $35 Pittsburgh or Youngstown, and several companies are quoting this price on spot business. Others, however, with little tonnage for sale, are asking $36. Rerolling billets have not been widely sold at $35, and several large consumers are holding out for a lower price. The same situation applies to slabs, while forging billets are now well established at $40 a ton. On wire rods, the $42 price is holding and contract tonnage has been regularly covered at that figure.

Bars, Shapes and Plates.—Specifications are lagging slightly as compared to June, but do not suggest a summer slump of any marked proportions. On plates, neither shipments nor specifications have declined materially, and delivery promises still are from four to six weeks. Falling off in bar tonnage is attributed partly to the lesser requirements of the cold-finished makers, who are not operating at as high a rate as recently. In general, bar business is fairly well distributed, with reinforcing steel rather active. A large boulevard project in the district will require about 2100 tons of reinforcing bars and a bridge across the Ohio River at McKees Rocks will take 900 tons for approaches. The superstructure of this bridge, which will require about 15,000 tons of structural steel, will not come up for bids for several weeks. Structural awards in this district are not running into much tonnage, but a considerable amount of work is in prospect and local fabricators look for renewed activity in the late summer. A report that the Inland Waterways Corporation would soon take bids on 18 additional barges is unconfirmed, although this inquiry is expected in the fall. Barge business is not active, but builders are so well supplied with work that there is no anxiety for new orders. Prices are fairly well maintained, at least in the immediate Pittsburgh district. The 1.95c. Pittsburgh price on plates has never been better established, and occasional shading of this figure on bars usually takes the form of the same quotation on a Cleveland base. Prices on fabricated structural steel are feeling the depressing effects of keen competition, but concessions from the 1.95c., Pittsburgh, price on shapes are not common.

Rails and Track Supplies.—The Norfolk and Western is said to have closed against its recent inquiry for 39,000 tons of rails, but this road's inquiry for 3500 tons of tie plates and accessories still is pending. Other business in track accessories is confined largely to small lots. July business is somewhat behind that of June. Demand for light rails is almost entirely lacking, and some makers of light rails from billets have been forced to meet the competition of rerolled material, representing a concession of $2 a ton from the quoted price of $36, Pittsburgh mill.

Wire Products.—Conflicting reports as to the demand for manufacturers' wire indicate that business is not well distributed, although aggregate specifications seem to be holding well up to the June level. Jobber purchases have declined, but the movement into this channel is above the usual summer average. Prices on plain wire seem to be well established at 2.50c. to 2.60c., Pittsburgh or Cleveland. On nails, price weakness persists in competitive districts to the West and South, but sales at less than $2.65, base, per keg, in the immediate Pittsburgh territory, have not been reported.

Tubular Goods.—Considerable inter-

The Iron Age Composite Prices

Finished Steel

July 16, 1929, 2.412c. a Lb.

One week ago	2.412c.
One month ago	2.412c.
One year ago	2.319c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1929	2.412c.,	April 2;	2.391c.,	Jan. 8
1928	2.391c.,	Dec. 11;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18

Pig Iron

July 16, 1929, $18.42 a Gross Ton

One week ago	$18.54
One month ago	18.63
One year ago	17.09
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1929	$18.71,	May 14;	$18.29,	March 19
1928	18.59,	Nov. 27;	17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
Del'd Philadelphia	2.27c.
Del'd New York	2.29c.
Del'd Cleveland	1.92½c. to 1.95c.
F.o.b. Cleveland	1.90c. to 1.95c.
F.o.b. Lackawanna	2.05c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.	2.05c.
F.o.b. Pittsburgh mills, cut lengths	2.30c.
F.o.b. Birmingham, mill lengths	2.15c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.85c. to 1.90c.
F.o.b. Chicago Heights mill	1.95c.
Del'd Philadelphia	2.27c.

Iron

Common iron, f.o.b. Chicago	2.05c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.15c.
F.o.b. Coatesville	2.05c.
F.o.b. Sparrow Point	2.05c.
F.o.b. Lackawanna	2.05c.
Del'd New York	2.22½c.
C.i.f. Pacific ports	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.05c.
F.o.b. Bethlehem	2.05c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.01c. to 2.06c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	2.00c.
Wider than 6 in., P'gh	1.90c.
6 in. and narrower, Chicago	2.20c.
Wider than 6 in., Chicago	2.10c.
Cooperage stock, P'gh	2.20c.
Cooperage stock, Chicago	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.65c. to 3.60c.
Strips, P'gh	2.75c. to 2.85c.
Strips, Cleveland	2.75c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.65 to $2.75
Galvanized nails	4.65 to 4.75
Galvanized staples	3.35 to 3.45
Polished staples	3.10 to 3.20
Cement coated nails	2.65 to 2.75
	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.50 to $2.60
Annealed fence wire	2.65 to 2.75
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.10 to 3.20
Barbed wire, galv'd	3.30 to 3.40
Barbed wire, painted	3.05 to 3.15
Woven wire fence (per net ton to retailers)	65.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., (wire) mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.70
Less carloads, Wheeling or Reading	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh.	2.10c. to 2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.30c.
No. 10, blue annealed, del'd Phila.	2.42c. to 2.52c.
No. 10, blue annealed, B'ham	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.25c. to 2.35c.
No. 13, f.o.b. Chicago dist.	2.45c.
No. 13, del'd Philadelphia	2.67c.
No. 13, blue annealed, B'ham	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.85c. to 2.95c.
No. 24, f.o.b. Chicago dist. mill	3.05c.
No. 24, del'd Philadelphia	3.17c. to 3.27c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh	4.10c. to 4.20c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.70c.
No. 24, f.o.b. Chicago dist. mill	3.80c.
No. 24, del'd Cleveland	3.69c. to 3.79c.
No. 24, del'd Philadelphia	3.92c. to 4.02c.
No. 24, f.o.b. Birmingham	3.75c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1¼% Nickel)	0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is ¾c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ½ in. and larger	$2.80
Spikes, ⅜ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plates, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47½	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	½	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on block by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	40	1½ in.	1
2½ in.—2¾ in.	48	1¾ in.	8
3 in.	54	2 in.—2¼ in.	13
3¼ in.—3¾ in.	56	2½ in.—2¾ in.	16
4 in.	59	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2½ in.	34	4½, 5 and 6 in.	42
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

est is centered in line pipe projects. Mills are fairly well supplied with business in the larger sizes of pipe, and the promise of some heavy lettings in the fall, if fulfilled, will provide a satisfactory year's business. Oil country material is moving steadily, but not in large proportions. Business in mechanical tubing has failed to show any marked recession from recent levels.

Sheets.—One large maker reports its specifications last week as the best since early in April, and the industry as a whole seems to be continuing the high pace set earlier in the year. Operations last week were seriously curtailed by the hot weather, and all of the larger mills are still much more concerned in making deliveries than they are in new business. Only the common finishes of black sheets and occasionally galvanized material can be obtained in less than three or four weeks, and makers of blue annealed sheets and light plates hesitate to promise shipment before Sept. 1. This situation holds true to a lesser extent on automobile body and metal furniture sheets, the former as a result of heavy August specifications by several automobile makers. These tonnage releases also indicate a renewed demand from that source early in the fall. The price situation in sheets shows little change, with the principal weakness in the galvanized product. Concessions from the 3.60c., Pittsburgh, price to jobbers persist, but are not recognized as the market by leading makers, who are taking business at 3.60 and 3.70c. On black sheets, the market is quotable at 2.85c. to 2.95c., Pittsburgh, the lower figure applying only to very large buyers, principally in the automotive field.

Tin Plate.—Prospects are better than they were a month ago, and although mills are being operated largely on a week-to-week business, there is nothing to indicate any marked falling off in specifications during the summer. September tonnages of the leading container manufacturers, which are ordinarily specified prior to July 15, are up to expectations. Crop information is more encouraging, and only an unforeseen curtailment of demand in the closing months of the year will prevent the total tonnage from equaling last year's record production. Operations in the Pittsburgh district average 90 to 95 per cent of capacity.

Strip Steel.—The strip market is rather quiet, with specifications not far behind the June levels, but with mills having little difficulty in making deliveries on either the hot or cold-rolled material. Business is not so well diversified as might be desired. Shipments to the automobile industry are considerably below peak levels. Cold-rolled strip is quotable at 2.75c. to 2.85c., Pittsburgh or Cleveland, although the higher figure is now applying on little tonnage. The market on hot-rolled strip is well established at 1.90c. and 2c., depending upon the width.

Cold-Finished Steel Bars.—This market has again become established on the hand-to-mouth basis which usually applies in the case of normal demand. Specifications are holding up rather steadily for this time of the year and compare favorably with June business. Changes in extras, which have been in preparation for some time, are expected to be announced in a short time. The base price is unchanged at 2.30c., Pittsburgh.

Coal and Coke.—Furnace coke is more plentiful in the face of light demand, but operators hesitate to curtail production materially on account of an expected improvement in the near future. The H. C. Frick company is still operating about 3100 ovens in the Connellsville district, but most of the plants are being run on a five-day week basis. The market is quotable at unchanged prices, or $2.75 to $2.85 per net ton, Connellsville. Shipments of foundry coke are light, but demand is not below normal for this time of the year. Price weakness is confined to the less desirable grades.

Old Material.—A small sale of No. 1 heavy melting steel at $19 during the last week seems to give the market added strength. However, there has been little large buying by the mills, and the average price for No. 1 scrap seems to have changed little from $18.50, as quoted last week. In view of scattered sales at varied prices, a wider range on prices is needed to show the market fairly. The sale of a part of the recent Pennsylvania Railroad list to a mill in this district at close to $19.50 also bears out the strength of the market, as this steel ordinarily commands a premium of 50c. a ton over average No. 1 steel. In the absence of sizable transactions, compressed sheet steel is unchanged at recent levels, while heavy breakable cast has been advanced 50c. a ton on a recent transaction. The market is rather tight so far as buying by dealers is concerned, and purchases of heavy melting steel are reported at less than $18, as well as at more than $18.50. With steel operations extraordinarily high for this time of the year, sentiment in the scrap market is inclined to be of a bullish nature, although other dealers are inclined to view with caution the rather frequent rejections at many points and a hold-up at at least one large consuming center.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.00 to $19.00
No. 2 heavy melting steel	16.00 to 16.50
Scrap rails	17.50 to 18.00
Compressed sheet steel	18.00 to 18.50
Bundled sheets, sides and ends	16.50 to 17.00
Cast iron carwheels	16.00 to 16.50
Sheet bar crops, ordinary	19.00 to 19.50
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	18.25 to 18.75
Hvy. steel axle turnings	16.00 to 16.50
Machine shop turnings	11.50 to 12.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.50 to 22.00
Railr. coil and leaf springs	21.50 to 22.00
Rolled steel wheels	21.50 to 22.00
Low phos. billet and bloom ends	22.00 to 22.50
Low phos., mill plates	22.00 to 22.50
Low phos., light grades	20.00 to 20.50
Low phos., sheet bar crops	20.00 to 21.00
Heavy steel axle turnings	16.00 to 16.50
Electric Furnace Grades:	
Low phos., punchings	19.50 to 20.50
Hvy. steel axle turnings	16.00 to 16.50
Blast Furnace Grades:	
Short shoveling steel turnings	12.00 to 12.50
Short mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	20.00 to 21.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.45c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Productive Activity Sets Another Record

Manufacturing operations are believed to have made another high record in June, based on their consumption of electrical energy, according to *Electrical World*. While the index declined from 136.9 in May to 135.2 in June, seasonal correction, it is thought, would show a new high mark. There was a heavy falling off in the metal industries group, which dropped to 147.9 from 154.8 in May. Of the two components, rolling mills and steel plants, dropping from 172.2 to 154.3, showed the heavier loss. Other metal-working plants, ferrous and non-ferrous, declined to 143.4 from 144.2 in May.

Automobiles, including parts makers, dropped from 161.8 to 154. Gains were recorded in leather, forest products, paper and pulp, rubber, chemicals and allied products and stone, clay and glass.

The American electric rotary clay gun will be provided for one of the leading blast furnaces in England by the William M. Bailey Co., Pittsburgh.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$35.00
Rerolling, 4 in. and under 10 in., Youngstown	35.00
Rerolling, 4 in. and under 10 in., Cleveland	35.00
Rerolling, 4 in. and under 10 in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basis Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	33.00c. to 35.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	33.00c. to 35.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.00 to $15.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton	
10%	$31.00	12%	$35.00
11%	33.00		

Silvery Iron

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton	
6%	$24.00	10%	$29.00
7%	25.00	11%	31.00
8%	26.00	12%	33.00
9%	27.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to $18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅜ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	70
Semi-finished hexagons castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(7/16-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Automobile and Farm Implement Industries Taking Steel in Larger Quantities After Letdown

CHICAGO, July 16.—Among the noteworthy developments in this market are strong indications of greater consumption of steel by the automobile industry and by manufacturers of farm equipment. A week ago automobile parts makers started heavier production and now several large automobile builders have asked for heavier shipments to commence before Aug. 1. On the whole, the local steel market is firm.

Lessening in the strain on supplies of semi-finished steel is of distinct advantage to integrated mills, which now find rolling schedules easier to arrange and so are able to give better deliveries both as to time and variety of steel products.

New sales for the week were not large, but this is not surprising in view of the heavy purchases in the preceding 15 days. Specifications are steady at the average so far this year, and local steel mills continue to produce at capacity.

The Great Northern has placed 30,000 tons of rails, about 18,000 tons of which will be rolled by Chicago mills. Another Northwestern railroad will take 15,000 tons and a like tonnage is expected from the Pennsylvania. Western rail mills are well scheduled through August.

Several pipe line projects, including two lines from the Southwest to Chicago which will take nearly 440,000 tons of steel, and a 20-mile gas line in Kansas, are taking shape. Close to 40,000 tons of new building projects, not including steel mill additions, are in sight in the immediate Chicago district.

Pig Iron.—Northern iron is holding firm at $20 a ton, local furnace, and buying for the current quarter and last half is active. Prices for Southern iron, which is reaching Chicago and northern Illinois, are wavering. Nominally the market is at $14.50 a ton, Birmingham, but $14 is freely done and concessions are reported below this last figure. Some sellers are taking orders for later billings with prices to be adjusted at the time of shipments in accordance with the market at that time. One order of this kind was for 500 tons. A more or less common way of doing business in Southern iron is to put low offers up to furnaces. It is reported most of these are accepted. Sales in northern Indiana and western Michigan are heavy, the aggregate for the week being near 7000 tons. Two thousand tons of Southern basic, sold to replace scrap at St. Louis, has been taken at a low figure.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$19.51 to 20.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Plates.—Demand for this commodity continues high from most consumers in the West. Manufacture of pipe is taking large tonnages, and tank makers in this and nearby territories are engaged at close to capacity. Car builders appear to be handicapped in their desire to increase output by the scarcity of skilled labor. Specifications from this source are heavy. New car orders are lacking, and there is further indication that the bulk of steel needed for old car business already has been ordered from mills. Several weeks ago a mill to the south of Chicago had received its last specification from car shops, and now one Chicago producer finds that releases for 4000 tons will complete its present obligations. Deliveries of plates are somewhat improved, being now in the range of six to eight weeks. This situation is tending to check the flow of new business from Western consumers to Eastern producers, but the total volume of plates placed to the east of Chicago was large and shipments coming to local consumers will be heavy for some time to come.

Structural Material. — Although there still is complaint that building permits in the Chicago area are low for this time of the year, it is quite apparent that the drop is less noticeable in the steel frame type of structure than it is in other kinds of building construction. Awards in the past week have been scattered and not of impressive size when considered individually. However, in gaging this situation it should be remembered that in recent months a number of extra large tonnages have been awarded and that much of that tonnage is still going through local shops. Steel mill expansion alone is engaging a fair part of local shop capacity, and the announcement by the Illinois Steel Co. that it will add materially to its South and Gary works forecasts the use of large tonnages for that purpose. A permit has been issued for the Cuneo Tower Building, noted a week ago, which will take close to 8000 tons. A theater and office building project for Wacker Drive, Chicago, will take 12,000 tons. All told, the pending list of steel structures is impressive. Shops at Milwaukee are busy, but in Indiana most fabricators are in need of additional work.

Mill prices on plain material, per lb.: 2.05c. base, Chicago.

Ferroalloys.—The market for spiegeleisen is quiet in new orders, but shipments are steady. Ferromanganese is quoted at $105 a ton, seaboard, but no sales are reported.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Sheets.—Consumers of this commodity are for the most part busy and are entering liberal specifications. Releases are fully equal to shipments, which represent 85 per cent of hot mill capacity. New buying, though steady, is for the most part for nearby needs. Prices in the local market are firm, but light gage sheets, such as used by the roofing trade, are weak when for delivery in the Southeast and Southwest. Locker makers are busy and have substantial orders. Light tank manufacturers find their books growing, and they are releasing larger tonnages to the mills.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.10c.; No. 24 galv., 3.85c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—This market remains dull in both private and public buying. Car lot purchases, like large tonnages, are scarce, though prices remain steady at $37 to $38 a ton, Birmingham, for diameters 6 in. and larger. West Allis, Wis., is said to have ordered 32,000 ft. of 24-in. pipe from the United States Pipe & Foundry Co. Among new inquiries are 1668 tons of 3 to 12-in. Class B pipe for Chicago and 100 tons for a filtration plant at Popular Bluffs, Mo.

Prices per net ton, del'd Chicago: Water pipe, 6-in. and over, $45.20 to $46.20; 4-in., $49.20 to $50.20; Class A and gas pipe, $3 extra.

Bars.—This has been another good week from the viewpoint of specifications for mild steel bars. Releases are fully equal to shipments, which are at the capacity of local bar mills. Sales in the past seven days have been light, but this was not unexpected, since the bulk of third quarter contracts had been closed by the end of the second week in July. Of special interest is the fact that many users sought to cover for all of the last half, a move that seldom occurs at this time of the year. Automobile acces-

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.10c. to 2.40c.
Reinforc'g bars, rail steel	1.90c. to 2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¼ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ⅜ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

sory manufacturers are arranging schedules for the next two months. It is quite evident, as judged by their estimates of steel needs, that they are looking forward to the near future with optimism. Farm implement makers are encouraged as to the outlook both in the summer months and for the fall trade. This is reflected in their attitude toward the estimates of the steel they will need in the next three months. Shipments of alloy steel bars are steady at 85 per cent of local mill capacity. Deliveries range from three to four weeks. Specifications do not bulk as large as in either the first or second week of July. With the Moline mill again in operation, all rail steel bar units in this district are producing. Prices are firm at 1.95c. a lb., local mill, and deliveries range from three to four weeks. Specifications are fully equal to output. New buying, both for future and immediate needs, is quiet.

Bolts, Nuts and Rivets.—Demand for these commodities is easier from the railroads, but heavier from manufacturers of farm equipment. The net result is that shipments are about steady and output remains at 65 per cent of capacity. Stocks in the hands of producers are low.

Reinforcing Bars.—Pending projects, though in large volume, are moving slowly, and not an impressive amount of new business is coming before the trade. Stagnation of the market is adding to the weakness of prices, which, at 2.10c. to 2.40c. a lb., warehouse, for billet steel reinforcing bars and 1.90c. to 2.05c. for the rail steel commodity, have been wavering in recent weeks. Thorgesen & Erickson have been awarded the general contract for track elevation by the Chicago, Milwaukee, St. Paul & Pacific. This project will require 800 tons of bars. Bids will be opened July 15 on the 1200 tons needed by the Jewel Tea Co., Barrington, Ill.

Old Material.—This summer's scrap market is unusually steady because of heavy and uniform consumption by most users. Demand is holding prices at a higher relative level than in previous years. Week to week fluctuations are almost negligible. Supplies of the heavy tonnage grades are ample, but consumption is high and there appears to be little opportunity for yards to accumulate scrap in anticipation of heavier demand in the fall months. On this score, there is general accord among sellers that present quotations will hold moderately well in the coming weeks and that renewed buying, which is expected in September, will result in stronger prices. Sellers are working hard to cover their short positions in the market. One steel mill, which a week ago cut shipments of heavy melting steel, is again taking normal tonnages. A recent railroad offering of this grade brought $15.10 a gross ton, delivered, but odd cars are quickly being taken out of the market at as high as $15.30 a ton. Shipments of cast iron borings to blast furnaces are curtailed while one merchant stack is being relined. The supply of this grade is free, and brokers are paying $9.75 to $10.25 a gross ton, delivered, against old orders. Hydraulic bundles are being produced faster than consumers will take them. The best offer made by a mill in recent weeks is $13 a gross ton, delivered. The cast iron wheel market is quiet both in shipments and sales.

Prices deliv'd Chicago district consumers:

	Per Gross Ton
Basic Open-Hearth Grades:	
Heavy melting steel	$14.75 to $15.25
Shoveling steel	14.75 to 15.25
Frogs, switches and guards, cut apart, and misc. rails	16.25 to 16.75
Hydraul. compressed sheets	13.00 to 13.50
Drop forge flashings	10.50 to 11.00
No. 1 busheling	13.00 to 13.50
Forg'd cast and r'l'd steel carwheels	18.25 to 18.75
Railroad tires, charg. box size	18.50 to 19.00
Railroad leaf springs cut apart	18.50 to 19.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.75 to 17.25
Coil springs	19.00 to 19.50
Electric Furnace Grades:	
Axle turnings	14.50 to 15.00
Low phos. punchings	16.50 to 17.00
Low phos. plates, 12 in. and under	16.50 to 17.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings	9.75 to 10.25
Short shoveling turnings	9.75 to 10.25
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	16.00 to 16.50
Rerolling rails	17.50 to 18.00
Cupola Grades:	
Steel rails less than 3 ft.	17.75 to 18.25
Steel rails less than 2 ft.	18.25 to 18.75
Angle bars, steel	17.00 to 17.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Railroad	16.75 to 17.25
Agricultural	15.50 to 16.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
	Per Net Ton
Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	21.00 to 21.50
Iron car axles	26.00 to 26.50
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.00 to 13.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.00 to 7.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	10.00 to 10.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plates	12.25 to 12.75
Grate bars	11.75 to 12.25
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Wire Products.—Demand for wire and wire products continues to taper, and mill output has been cut to 65 per cent of capacity. Jobbers are finding business rather spotty, but better than a year ago. The jobbing trade got under way late in the spring, with the result that the early summer demand has been better than usual. Use of nails is light, and competition, especially in the Southwest and Southeast, is unusually keen. The price situation in this commodity is unchanged. Quotations in and near Chicago are moderately steady, while in outlying districts price cutting is in evidence. Stocks in the hands of jobbers are of small size, but mill deliveries are prompt in wide assortments and the trade is not experiencing trouble in obtaining ample supplies on short notice. Specifications from the manufacturing trade show a slight decline.

Rails and Track Supplies.—The Great Northern has ordered 30,000 tons of standard-section rails. The Illinois Steel Co. was given an order for 13,000 tons, Inland Steel Co. 5000 tons, and Bethlehem will furnish 12,000 tons. About 30,000 tons of rails will soon come into the market, according to the estimates of local producers. The Northern Pacific is expected to take 15,000 tons, and it is probable that the Pennsylvania may order a like tonnage. Track orders aggregate 3000 tons. Pending tonnage is not less than 15,000 tons, of which 10,000 tons is for the Great Northern and the Northern Pacific and 5000 tons for the Pennsylvania. The light rail market is listless.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Coke.—Prices for by-product foundry coke are steady at $8 a ton, local ovens. Spot buying is dull, but specifications against past obligations are heavy, and the shipping rate in July is close to the average in June.

More Steel Ties to Be Used on British Railroads

Further purchasing of railroad steel ties, following that of the Southern Railway (British) earlier in the year, is reported by Commercial Attaché William L. Cooper, London, to the Department of Commerce. The London, Midland & Scottish Railway has placed an order with the United Steel Companies, Ltd., for between 500 and 600 tons of pressed steel railway sleepers of the Sandberg heavy type. The London & North-Eastern Railway has placed a similar order of 500 tons.

To Merge Nipple Plants

Stockholders of the H. C. Atkins Mfg. Co., St. Louis, have voted to increase the capital stock of the company to $1,000,000 and have authorized the board of directors to negotiate for the purchase of several other pipe nipple manufacturing plants. The company's plan provides for merging of eight or ten such plants either by outright purchase or an exchange of stock.

American Institute of Steel Construction has awarded three cash prizes totaling $850 to university students who submitted the most authentic designs for a theoretical bridge in steel. The contest was held to stimulate interest in improved bridge designing.

New York

Heavy Tonnages of Pipe Pending for Gas Pipe Lines—Pig Iron Melt Sustained

NEW YORK, July 16.—The average melt of iron among the larger foundries is well sustained, but smaller consumers have been operating at a slightly reduced rate since the beginning of the quarter. Inquiry for third quarter iron, however, is active, with the present total for this district estimated at about 10,000 tons or more, and sales in the past week were in excess of 8000 tons. Among the sizable purchases of the week was 1000 tons of No. 1X foundry by the Draper Corporation, North Hopedale, Mass., which originally inquired for 2000 to 3000 tons. The Universal Winding Co., Providence, R. I., has closed on 700 tons of No. 1X and 600 tons of No. 2X foundry iron and the American Locomotive Co. has bought upward of 500 tons of foundry iron and a carload of malleable for its Schenectady, N. Y., plant. The New York Air Brake Co., Watertown, N. Y., has closed on a minimum carload of malleable of special analysis, reported to be for experimental purposes. About 3000 tons of foundry iron of a total inquiry for about 4000 tons, recently closed by the General Electric Co., Schenectady, N. Y., for various plants, is reported to have gone to the New England furnace, which has also booked about 10,000 tons of foundry iron for shipment to the pipe foundry at Burlington, N. J. Current inquiries for pig iron include some tonnage pending for a fortnight or more; about 4000 tons for plants of the American Radiator Co., 3500 tons for the Trenton, N. J., plant of the National Radiator Co., and about 2000 tons for the Chapman Valve & Mfg. Co., Indian Orchard, Mass. The Worthington Pump & Machinery Corporation, Harrison, N. J., is inquiring for 100 tons of foundry iron for Holyoke, Mass. Sales of Southern foundry iron in this district are rather limited, consumers apparently manifesting interest in it chiefly as a possible factor in bringing out lower prices from their usual sources of supply. Buffalo furnaces are quoting $18 a ton, base, on much of the small tonnage business in the market, but the larger and more desirable inquiries still bring out $17.50 a ton, with slightly lower prices on occasion.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$22.41 to $22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Warehouse Business.—The number of orders for steel from warehouse stocks continues fair, but the tonnage per order has begun to increase in the past week. There is a moderate volume of structural steel buying, and demand for reinforcing bars is larger than early in the month. Recently some substantial business in plates has been reported by jobbers. Black and galvanized sheets are moderately active, but prices are still being shaded $1 to $2 a ton.

Cast Iron Pipe.—Buying by private companies has improved in the past week, but prices show no tendency to advance, ranging from about $30 to $32 a ton, base, f.o.b. Northern foundry. Current inquiries for pipe are in most cases for the larger diameters, which are cast by only a few makers. Syracuse, N. Y., has opened bids on about 2000 tons of 42-in. and 48-in. water pipe. Hartford, Conn., is accepting bids on a contract which will require 4000 to 5000 tons of pipe; 16,925 ft. of 42 or 48-in. and 2075 ft. of 36-in., Class B or Class C, with alternate bids on steel or reinforced concrete pipe. The Government of the Philippines is taking bids on about 1300 tons of 20-in., 36-in. and 54-in. water pipe for Manila.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $32.60 to $34.60; 4-in. and 5-in., $35.60 to $37.60; 3-in., $42.60 to $44.60. Class A and gas pipe, $3 extra.

Finished Steel.—Two large gas pipe line contracts are on the verge of being closed, one for 191,000 tons and the other for 250,000 tons. The contracts will cover the pipe for lines running from the Southwest into the Chicago district, but the orders will be placed in New York. The steel for one line, that of the Central States Natural Gas Co., mentioned a week ago as in prospect, is virtually closed, while the 250,000 tons to be bought is for a line to be built by Henry L. Doherty & Co., New York. Still another pipe line project is in the development stage and will be built by a group consisting of the Columbia Gas & Electric, Standard Gas & Electric, Utilities Power & Light and the American Gas & Electric companies. It is said that connecting links with existing gas lines will be built that will bring natural gas to Pennsylvania, New Jersey and New York utility companies. Main lines, with their connections, probably will require 1000 miles of pipe. About 600,000 tons of steel pipe has been ordered so far this year for gas lines alone; in addition, there has been considerable contracting for oil lines. Structural steel activity continues a prominent feature of steel buying in the New York district. The week's awards, totaling more than 14,000 tons in the district, included 5800 tons for a bridge over the Hackensack River in New Jersey, 2400 tons for the County Trust Co. building in New York and 1200 for a building for the Brooklyn *Daily Eagle*. Inquiries are headed by 4000 tons for a telephone building on Eighteenth Street, New York, and 2000 tons for a hotel at Atlantic City, N. J. In general, steel business shows a slight tapering off, but is

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 6 in. and smaller	50 to 50 and 10

	Per 100 Ft.
Boiler Tubes—	
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-3-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12 in. lap	3	+16

Tin Plate (14 *x* 20 *in.*)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 *x* 20 *in.*)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

still unusually good for this time of the year. Except for continued weakness in wire nails and galvanized and black sheets, the price situation is steady. The top price, 3.70c., Pittsburgh, on galvanized sheets has virtually disappeared, current prices being 3.50c. to jobbers and 3.60c. to consumers.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.29c.; plates, 2.22½c.; structural shapes, 2.19½c.; bar iron, 2.14c.

Old Material.—Except for No. 1 and No. 2 heavy melting steel, the scrap market is quiet and prices are only moderately firm. Brokers with contracts at $16 a ton, delivered Claymont, Del., and $16.50 per ton, Coatesville, Pa., are paying $16.25 a ton, Claymont, and up to $16.75 per ton, Coatesville, to obtain sufficient No. 1 steel. A similar situation exists in No. 2 heavy melting steel, with brokers paying $13, delivered to a Phoenixville, Pa., consumer, and $13.50 a ton, delivered to Harrisburg, Pa. While only a small tonnage of No. 2 heavy melting steel is moving to the Pittsburgh district, brokers filling contracts for No. 1 steel with western Pennsylvania mills are paying up to $18.75 per ton, delivered, on a $5.30 a ton freight rate, or $13.45 per ton, New York. Heavy breakable cast is quiet, with $14.50 a ton quoted for delivery to eastern Pennsylvania and $15 a ton, delivered to a Florence. N. J., foundry.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.75 to $13.35
Heavy melting steel (yard)	8.00 to 9.75
No. 1 hvy. breakable cast.	10.75 to 12.00
Stove plate (steel works).	7.75 to 8.25
Locomotive grate bars....	8.25 to 8.75
Machine shop turnings....	7.25 to 7.50
Short shoveling turnings..	7.25 to 7.50
Cast borings (blast furn. or steel works).....	7.00 to 7.25
Mixed borings and turnings	6.75 to 7.25
Steel car axles.....	19.25 to 19.75
Iron car axles.....	24.00 to 25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	10.75
Forge fire	9.50 to 10.00
No. 1 railroad wrought...	12.00 to 12.50
No. 1 yard wrought, long..	11.00 to 11.50
Rails for rolling.....	13.00 to 13.50
Cast iron carwheels.....	12.25 to 12.50
Stove plate (foundry)....	8.00 to 8.50
Malleable cast (railroad)..	14.00 to 14.50
Cast borings (chemical)..	10.00 to 10.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast.....	$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size.....	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

Reinforcing Bars.—There has been a slight improvement in sales, although the market still is rather quiet. Awards and inquiries have consisted of lots ranging from 300 tons down to single carloads. Prices are unchanged.

Billet steel reinforcing bars in 40, 50 and 60-ft. lengths, 2.05c. per lb., Pittsburgh, and 2.30c. per lb., Pittsburgh warehouse, for cut lengths. Out of New York warehouse, 2.90c. per lb. for lots of 5 tons or more, 3.05c. for lots of 2 to 5 tons and 3.30c. for less than 2 tons, all delivered at job.

Coke.—Demand for foundry coke is fair, but the furnace grade is rather inactive. Some by-product coke for industrial use is being shipped from a local operation by barge and rail to nearby consumers. Prices are unchanged at $2.75 to $2.85 a net ton, Connellsville, for standard furnace coke, and $4.85 a net ton, ovens, for special brands of beehive foundry coke. Delivered prices of foundry grade are: To northern New Jersey, Jersey City and Newark, $8.56, and to New York and Brooklyn, $9.44 a net ton. By-product coke is quoted at $9 to $9.40 a net ton, Newark or Jersey City, and $10.06, New York or Brooklyn.

Cleveland

Consumers Continue to Take Steel in Large Volume—Easier Deliveries in Sheets and Strips

CLEVELAND, July 16.—Specifications for steel bars, plates and structural material showed quite a gain the past week over the first week in the month. While orders increased in number, they were mostly for small tonnages. Consumer plants in this territory continue in good operation with a satisfactory volume of business on their books.

Manufacturers of steam shovels and other road building equipment are very busy. The only slowing down is in plants making forgings and stampings for the automotive industry. While these continue in good operation, several have abandoned night shifts. While further curtailment by some of the automobile plants is looked for in the next few weeks, others will increase production with the bringing out of new models in August. However, a good total production is being sustained due to the continued heavy output by the Ford and Chevrolet companies, and the automotive industry predicts that the third-quarter production of cars will exceed any previous record for the period.

Plates are in fair demand in small lots from tank and boiler shops. Local fabricating shops are busy with small work. New inquiry in the building field continues light. Toledo will take bids Aug. 13 for a Maumee River bridge, requiring several thousand tons.

Some of the sheet mills are caught up on deliveries but others are fully committed for six weeks or longer and there has been little curtailment in operation. Weakness in sheets has increased and extended to blue annealed grades. Cold-rolled strip is dull and some of the mills need orders, this being the only product on which mills are up on deliveries.

While there is some irregularity on steel bars, the price is being fairly well maintained at 1.95c., Cleveland. No deviation is reported from the 1.95c., Pittsburgh, price on plates and structural material.

Pig Iron.—The market did not show much activity the past week, during which Cleveland interests sold 11,000 tons of foundry and malleable iron. Not much inquiry is pending. Most foundries that have not yet bought iron for the third quarter seem disposed to keep out of the market until their present stocks are used up. Prices appear to be holding firm at $18.50, Cleveland, for outside shipment, $19 for local delivery and $20, Lake furnace, for delivery in the Michigan territory. Some furnaces report a falling off in shipping orders this month as compared with June and others expect to move about as much iron as last month, during which their shipments fell 10 per cent below the tonnage shipped in May. There has been considerable slowing down among some of the large-production foundries that supply the automotive industry. A number of malleable foundries that are making castings for the Ford Motor Co. are keeping up to recent operations. With decreased shipments, most of the furnaces are adding to their stock piles. A small cargo of pig iron was shipped from Buffalo to the Chevrolet Motor Co., Saginaw, Mich. The river channel has been deepened so that water shipments can be made directly to this company's plant, and it is expected that regular shipments will be made by water from Buffalo to Saginaw.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$19.50
S'th'n fdy., 1.75 to 2.25....	20.50
Malleable	19.50
Ohio silvery, 8 per cent...	28.00
Basic Valley furnace.....	18.50
Stand. low phos., Valley..	$26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—The leading local producer has its entire output for the third quarter sold. This mill has specifications to keep it operating at capacity for three weeks and specifications about equal production. While all third quarter contracts for sheet bars, billets and slabs were closed at

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforc. steel bars.....2.25c. to	2.50c.
Cold-fin. rounds and hex.....	3.65c.
Cold-fin. flats and sq.....	4.15c.
Hoops and bands, No. 12 to ¼ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip .....*5.95c.	
Black sheets (No. 24).....3.70c. to	3.90c.
Galvanized sheets (No. 24).4.60c. to	4.75c.
Blue ann'l'd sheets (No. 10).....	3.25c.
No. 9 ann'l'd wire, per 100 lb.....	$2.95
No. 9 gal. wire, per 100 lb.....	3.40
Com. wire nails, base per keg.....	2.95

*Net base, including boxing and cutting to length.

$35, Cleveland, Youngstown or Pittsburgh, shipments of billets and slabs are still being made against $34 second quarter contracts that have not been cleaned up. One consumer is inquiring for 2000 to 5000 tons of slabs for October and November shipment.

Sheets.—Most consumers are showing more interest in getting deliveries of sheets on order than in placing new business. The falling off in the demand for auto body sheets is offset in a measure by a good demand for full finished sheets from makers of building material and other users. Furniture sheets and enameling stock are also active. Weakness has developed on blue annealed material, particularly in the heavy gages. Concessions credited to continuous mills of $2 a ton on light sheets and more on the heavier material or light blue annealed plates are reported. On black sheets 2.85c., Pittsburgh, is quite commonly quoted, although some material carrying the higher finishes is being taken at the 2.95c. base. Galvanized sheets have weakened to 3.50c., Pittsburgh, and there are reports of even a lower price.

Wire Products.—Wire continues to move in a fair volume and the price is well maintained. Nails are quiet and subject to price irregularities in some districts.

Warehouse Business.—While sales are not as heavy as in June, the volume of business is satisfactory for a summer month. Orders are well diversified. Sheets are quieter. All prices are well maintained.

Strip Steel.—Specifications for both hot and cold-rolled strip steel are moderate and deliveries have further improved. Several mills can make shipments in two weeks on both grades. Third quarter contracts for both hot and cold-rolled strip were closed during the week, at regular prices, by one of the automotive interests. Hot-rolled strip is firm at 1.90c. to 2c., Pittsburgh. On cold-rolled strip the market generally has settled down to a flat 2.75c., Cleveland, price, efforts to get a 2.85c. price for small lots evidently having almost wholly disappeared.

Bolts, Nuts and Rivets.—The demand for bolts and nuts, while lighter than a few weeks ago, is better than in July, last year. Rivet orders show a slight gain over those of June, which was a quiet month for the rivet industry. Prices are firm at regular quotations.

Coke.—The demand for foundry coke is light, both in specifications against contracts and in new business. Better brands of Connellsville foundry coke are firm. Ohio by-product coke is quoted at $8.25, Painesville, for July shipment.

Old Material.—The local market is at a standstill owing to restrictions of shipments of steel-making grades by two mills, and dealers are showing considerable anxiety to secure shipping orders. A fair amount of scrap is moving to the Valley district and this activity is apparently supporting the Cleveland market, which appears firm, although there has been no recent test of prices on steel-making grades for local delivery. Dealers are paying $17.50 to $17.75 for No. 1 heavy melting steel, $17 for compressed steel and $16.75 for new No. 1 busheling for Youngstown shipment. Old No. 1 busheling has advanced 25c. a ton. Other grades are unchanged.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	9.25 to 9.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.25 to 13.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades	
No. 1 cast	16.75 to 17.25
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.00
Miscellaneous	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅜-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.55c.
Steel bands, No. 12 to ⅜-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
†Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'l'd sheets (No. 13)	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Philadelphia

Steel Orders Numerous But for Small Tonnages—Galvanized Sheets Lack Firmness

PHILADELPHIA, July 16.—Specifications against third-quarter contracts are in good volume, but tonnages are smaller than in the second quarter. Buying is well distributed, however, and most steel mills are booking more business than is usual at this season. While operations are still maintained at a high rate, delays in delivery are generally shorter.

Prices are well maintained except on black and galvanized sheets, certain sheet mills which had considerable automobile business in the past quarter being in need of tonnage since buying by the automotive industry has slackened.

Eastern Pennsylvania pig iron prices are fairly well maintained despite competition from Birmingham producers, reported still to have stocks totaling in excess of 500,000 tons. The steel scrap market is stronger, especially prices of No. 1 and No. 2 heavy melting steel.

Bars.—Deliveries of most mills are shorter, ranging from one to three weeks. Operating rates are high and specifications, although for small tonnages, are unusually good for the season. Bars are quoted at 1.95c., Pittsburgh, or 2.27c., delivered Philadelphia.

Pig Iron.—It is estimated by pig iron sellers in this district that upward of 6000 tons of Southern iron has been sold to eastern Pennsylvania consumers since Birmingham furnaces began to quote on the present price level. Southern iron prices are $14.50 per ton, Birmingham, for foundry and $13.50 per ton for basic, or on a $6.01 per ton freight rate by rail and water, via Savannah, Ga., $20.51 for foundry and $19.51 for basic, on cars, Philadelphia. The movement of Southern iron via Norfolk, Va., has thus far been somewhat limited, as this routing necessitates shipping a minimum cargo of 700 tons. The petition of the Eastern railroads to the Interstate Commerce Commission to postpone reduction of the rate from Birmingham to Atlantic Coast ports, via Savannah, from $6.01 to $5.25, has been granted and a delay of about seven months is expected. About 1500 tons of cylinder iron for the Baldwin Locomotive Works is not yet reported placed, but with Birmingham iron available at about $20.37 per ton, delivered, all rail, purchase of Southern iron appears likely. It is also suggested that 3500 tons of foundry iron for the Trenton, N. J., plant of the National Radiator Co. may also go to a Southern furnace. On the usual purchases of small lots of foundry iron, eastern Pennsylvania furnaces have not found it necessary to offer concessions of more than about 50c. a ton from $21.50 per ton, furnace, but a desirable tonnage might bring out further concessions. The Virginia pig iron producer is preparing to go into blast early in October, with reduced production costs and, by taking advan-

tage of rail and water delivery to Atlantic Coast ports, via Newport News, Va., may make an effort to sell iron competitively in eastern Pennsylvania.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic (del'd east. Pa.)	20.25 to 21.00
Gray forge	20.50 to 21.00
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Reinforcing Bars.—Inquiry is improving slightly, but competition is keen. About 200 tons for the Hartel Avenue sewer, Philadelphia, has been awarded, both rail and billet steel bars being bought. The hospital building for the Woman's Medical College, Philadelphia, calls for about 300 tons of bars. Rail steel bars are quoted at about 1.95c., Franklin, Pa., or Tonawanda, N. Y., or 2.27c., delivered Philadelphia, with no extra for cutting to length. Sellers of billet steel bars are showing an increasing tendency to quote prices with no extra for cutting to length and certain eastern Pennsylvania mills rolling billet steel bars have quoted 1.95c., Pittsburgh, or 2.27c., Philadelphia, without the extra, which is equivalent to the rail steel bar price. Pittsburgh mills have quoted 2c. to 2.05c., Pittsburgh, or 2.32c. to 2.37c., delivered Philadelphia, usually adding the $5 extra for cutting to length.

Plates.—Deliveries range from two to three weeks, with specifications on contracts small in size, but numerous. Buying by locomotive builders and the railroads is quiet at present, but there is a fair tonnage of plates moving to car builders and fabricating shops, especially tank builders. The low bidder on a barge for the Central Railroad of New Jersey, calling for about 600 tons of plates, was the Bethlehem Steel Co., with the New York Shipbuilding Co., next. It is reported that the low bidder quoted on longer delivery than was specified in the inquiry. Plates are quoted at 2.05c., Coatesville, Pa., or 2.15c., delivered Philadelphia.

Shapes.—Prices range from 1.95c. to 2.05c., f.o.b. nearest mill to consumer, or 2.01c. to 2.11c., delivered Philadelphia. Fabricating shops are well occupied, but new business has slackened considerably. Recent projects in this district include about 2000 tons for an Atlantic City Hotel and a small tonnage for a soldiers and sailors memorial bridge at Harrisburg, Pa.

Sheets.—Blue annealed sheet prices are being maintained at 2.35c. per lb., Pittsburgh, or 2.67c., Philadelphia, for No. 13 gage and light plates, blue annealed, No. 10 gage are quoted at 2.20c., Pittsburgh, or 2.52c., delivered Philadelphia. Black sheets are being shaded $1 to $2 a ton on most current business, mills quoting 2.85c. to 2.95c., Pittsburgh, or 3.17c. to 3.27c., Philadelphia. Galvanized sheets have settled a full $2 a ton on recent business to 3.60c., Pittsburgh, or 3.92c., Philadelphia, and further concessions of $1 a ton or more have been made on desirable business. Certain mills, which were heavily engaged on automobile tonnage in the second quarter are now seeking business, while others not rolling automobile sheets are still asking up to four and five weeks delay in delivery.

Imports.—In the week ended July 13, arrivals at this port consisted of 153 tons of structural shapes from France and 35 tons from Germany.

Old Material.—No. 1 heavy melting steel is strong and an eastern Pennsylvania consumer is understood to have closed on 5000 to 10,000 tons of No. 1 steel at $17 per ton, delivered. No. 2 heavy melting steel is firm and a Pencoyd, Pa., mill has bought a small tonnage of automobile steel at $14.25 per ton, delivered. Stove plate is quotable at $12 to $12.50 a ton delivered, on the basis of a recent sale to a Harrisburg consumer at $12.50, and machine shop turnings show an advance of 50c. a ton on a sale at $12, delivered. There is a strong undertone to prices and available supplies of No. 1 and No. 2 heavy melting steel are not large.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$16.50 to $17.00
Scrap T rails	16.00
No. 2 heavy melting steel	12.50 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Bundled sheets (for steel works)	11.50
Hydraulic compressed, new	14.50 to 15.00
Hydraulic compressed, old	12.00 to 12.50
Machine shop turnings (for steel works)	11.50 to 12.00
Heavy axle turnings (or equiv.)	14.00 to 14.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	15.00 to 15.25
Railroad grate bars	12.00 to 12.50
Stove plate (for steel works)	12.00 to 12.50
No. 1 low phos., hvy., 0.04% and under	22.00 to 23.00
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
No. 1 blast f'nace scrap	10.50 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	15.00
Shafting	19.00 to 19.50
Steel axles	23.00 to 23.50
No. 1 forge fire	14.00
Cast iron carwheels	16.50 to 16.75
No. 1 cast	16.50 to 17.00
Cast borings (for chem. plant)	14.50
Steel rails for rolling	16.50 to 17.00

Steel Corporation Retires Total Bonded Debt

The board of directors of the United States Steel Corporation, at a meeting July 16, passed the necessary resolutions calling for redemption on Nov. 1 the entire outstanding issue of the corporation's 10-60-yr. 5 per cent bonds of 1963 at 110 and accrued interest. The amount of bonds of this issue outstanding at this date is $133,372,000.

To date the corporation, in accordance with the plan announced in letter to stockholders of March 5, has redeemed all but $15,880,000 of the outstanding issue of its 50-yr. 5 per cent gold bonds of 1951. Of this total, $7,933,000 are of the callable series and have been formally called for redemption on Sept. 1. Also on this latter date cash funds will be deposited with the trustee, at rate of 115 and accrued interest, to provide for purchase and retirement on presentation of such of the non-callable series bonds of this issue, now totaling $7,947,000, which may not have been redeemed prior to that date. Upon the retirement, or provision for retirement, of the 50-yr. 5 per cent bonds and the 10-60-yr. bonds, there will be fully discharged all of the bonded debt of the corporation.

Subscriptions for New Stock

Under the recent offer to stockholders to subscribe for additional shares of common stock at $140 per share, subscriptions have been received and recorded to date for 1,009,485 shares, or 99.3 per cent of the total of 1,016,605 shares offered. Some few subscriptions awaiting perfection of assignment of warrants and other details will probably add slightly to the total of 1,009,485 shares. Of the number of shares subscribed for, about 91 per cent were paid for in full on June 21 and 9 per cent were payable in installments on June 21 and on Oct. 1.

Employees' Stock Subscriptions

Under the employees' stock subscription plan for 1929, stock was offered on May 28 for subscription at $165 per share. The subscription closed on July 6, subscriptions having been received from 48,956 employees for a total of 83,079 shares. This compares with 49,612 subscriptions received for 94,077 shares in 1928, when the price at which the stock was offered was $145 per share

Newton Steel Earnings

YOUNGSTOWN, July 16.—For the second quarter this year the Newton Steel Co. reports record net earnings of $799,928, after all charges except preferred dividends, and after allowance for Federal taxes of $109,081. It is expected the company will show net profits this year equivalent to $12 per share of outstanding common stock.

Net profits of the company in the first half, totalling $1,519,890, exceeded net earnings for all of 1928 by $162,957.

The company has a large volume of unfilled orders and is assured near-capacity operations over remainder of the year. It makes full-finished auto body sheets. At Monroe, Mich., it is building a new sheet mill plant, to be closer to the heavy automobile production area.

Pacific Coast

Two Pipe Lines Will Require 24,000 Tons of Steel—Another of 149 Miles in Prospect

SAN FRANCISCO, July 13 (*By Air Mail*).—Demand for iron and steel products on the Pacific Coast is well sustained. Awards of the past week compare favorably with the totals for the last few weeks. Structural steel was the most active, and several fair-sized lots were placed, outstanding among which were 950 tons for an apartment in San Francisco, booked by McClintic-Marshall Co., and 630 tons for a bridge over the Salinas River for the State Highway Department. Pipe mill representatives and plate fabricators are keenly interested in the call for preliminary bids for a pipe line at Phoenix, Ariz., requiring 14,000 tons of plates, and the call for bids, at Seattle, for 10,000 tons for the Cedar River pipe line project, bids on which were postponed from July 5 to July 19.

Pig Iron.—Movement of foundry pig iron is limited to unimportant lots. No change in quotations is noted.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy. sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—While reinforcing steel bar awards this week fell below the previous week's total, upward of 1500 tons was booked. Among the larger lots were 416 tons for a bridge in California and 300 tons for highway work in Washington. Bids were opened this week on 168 tons for highway work at Phoenix, Ariz. Out-of-stock prices in the San Francisco district are unchanged at 2.20c., base, on carload lots and 2.60c., base, on smaller tonnages. Los Angeles out-of-stock quotations are $2 a ton higher. Demand for merchant bar steel is limited to unimportant tonnages, while the price remains firm at 2.35c., c.i.f. Coast ports.

Plates.—The largest plate award of the week called for 300 tons for a barge for the Santa Fe Railroad, placed with the Moore Dry Dock Co. Bids were opened this week on 100 tons for a 54-in. riveted steel pipe line for the East Bay Municipal Utility District, Oakland. Prices continue firm at 2.35c., c.i.f.

Shapes.—A fair amount of structural material was placed during the week, the total exceeding 3300 tons. The Isaacson Iron Works secured 160 tons for the City-County Building, Seattle, and 110 tons for a hangar for the Boeing Airplane Co., Seattle. Pending business is not of heavy proportions, but several fair-sized projects are scheduled to come out for figures in the near future. Plain material is firm at 2.35c., c.i.f. Coast ports.

Cast Iron Pipe.—Cast iron pipe awards of the week included 550 tons of 12-in. Class B pipe for a golf course at the Stanford University, which went to the United States Pipe & Foundry Co.; Palo Alto, Cal., 203 tons of 12-in. Class 150 pipe for the East Bay Municipal Utility District, Oakland, Cal., placed with the same interest, and 199 tons of 4 to 10-in. Class C pipe for San Diego, booked by Daley Corporation. The United States Pipe & Foundry Co. was low bidder on 2331 tons of 6 to 20-in. Class B pipe for the East Bay Municipal Utility District, Oakland. Bids were opened this week on 162 tons of 6 and 8-in. Class B pipe for Great Falls, Mont. New business calls for 1344 tons of 4 to 18-in. Classes C and D pipe for Vancouver, B. C., bids on which will be opened July 22 and for 1012 tons of 4 to 24-in. Class B pipe for Pasadena, Cal., bids on which will be opened July 18. Bert Noble was low bidder on 145 tons of 4 to 12-in. Class B pipe for San Diego.

Steel Pipe.—The Pacific Gas & Electric Co. has not yet taken any action on its inquiry for 2263 tons of 8⅝-in. O. D. gas pipe for installation at Gilroy, Monterey and Salinas, Cal. Eureka, Cal., placed a small tonnage of 2 and 3-in. galvanized standard pipe with the Lally Co. The Standard Oil Co. intends to build a pipe line in the San Joaquin Valley which will require 27 miles of 10-in. pipe, 50 miles of 8-in. and 72 miles of 6-in. pipe.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ¼-in. and over	3.15c.
Small angles, under ¼-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ¼-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struct. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Birmingham

Pig Iron Buyers Cautious and Sales Are for Nearby Requirements Only—Steel Business Holds Up

BIRMINGHAM, July 16.—Pig iron buyers continue to pursue a conservative policy in covering their third quarter requirements, despite the recent reduction in price, which established the base at $14.50 for No. 2 foundry. Most of the buying is for two to four weeks' requirements. The recent reductions in prices have undoubtedly made buyers cautious. The total tonnage placed last week was a little better than that of the preceding week because of the steady run of small orders and the resumption of activities after the holiday period. Prices below $14.50, Birmingham, have been made on recent sales for Northern shipment. The volume of shipments was better last week than the week before and a still larger movement is indicated. Furnace operations have been unchanged for several weeks. Of the 17 stacks in operation, nine are on foundry iron, seven on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.50
No. 1 fdy., 2.25 to 2.75 sil.	15.00
Basic	14.50

Finished Steel.—New business in bars, plates and shapes is undiminished. Backlogs in these lines have changed very little in the past three or four weeks, the volume being approximately twice the amount it was at this time last year. Sheet buying is more pronounced than it has been at this season in the past. Several small orders for standard steel rails have been booked this month. Wire products' business continues to fall below the June rate. Mill operations remain at the peak reached early last month. All prices are the same. Structural steel fabricators report a fair volume of small orders, but no large orders. Two of the larger fabricators have heavy backlogs. Active open-hearths number 22 out of a total of 23.

Old Material.—New business continues slow and in small lots for early requirements. Demand for cast iron grades is almost nil. Prices are unchanged.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.50
Scrap steel rails	12.50
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	$11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	13.50
Tramcar wheels	13.00
Cast iron carwheels	12.50 to 13.00
Cast iron borings, chem.	13.50 to 14.00

Cast Iron Pipe.—New business of pressure pipe manufacturers was less last week than the average of the several weeks preceding owing to the absence of large orders. Awards are pending on the project at Oakland, Cal., requiring 2200 tons, and a project at Houston, Miss., requiring about 20,800 ft. of 6 to 8-in. pipe. A project at Griffin, Ga., requiring about nine miles of 16 to 20-in. pipe is still pending, as is the 700-ton job at Hollywood, Fla. The United States Pipe & Foundry Co. has booked an order for 6000 ft. of 8-in. and 17,000 ft. of 6-in. pipe for Alabama City, Ala. The demand as a whole is estimated to be 20 to 25 per cent under what it was at

this season last year. New business for several weeks has been made up almost entirely of municipal tonnages. The lowest operation of any plant is about 65 per cent and the highest about 95 per cent. Prices are firm at $37 to $38.

Coke.—Activity in the foundry coke market is confined to shipments on contracts, which are going forward at the steady rate of the past several weeks. Approximately 95 per cent of the ovens in the district are active. The base price remains at $5.

Boston

Pig Iron Prices Still Unsettled—Some Grade of Scrap Scarce and Price Trend is Upward

BOSTON, July 16.—New England pig iron prices are still very much unsettled. The Universal Winding Co., Providence, R. I., bought 1500 tons—800 tons No. 2X and 700 tons No. 1X—from the Mystic Iron Works and a Buffalo stack. The No. 1X is reported to have sold at $21.78 a ton, delivered, equivalent to $17.50 a ton on cars, Buffalo, while the No. 2X was sold on a delivered basis equal to $17.32 a ton, on cars, Buffalo, allowing for a $4.28 rail and water rate. Alabama iron is lower. Transactions in western Pennsylvania, New York State and Buffalo irons are reported largely in car lots. Competition for even these small tonnages is keen, and furnaces have been obliged to shade prices to secure orders. A textile machinery maker, previously reported as in the market for 1000 tons of iron, may buy 2000 to 3000 tons. A central Massachusetts foundry still is uncovered on a round tonnage.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$21.28 to $21.78
†Buffalo, sil. 2.25 to 2.75	21.78 to 22.28
*Buffalo, sil. 1.75 to 2.25	21.91 to 22.41
*Buffalo, sil. 2.25 to 2.75	22.41 to 22.91
East. Penn., sil. 1.75 to 2.25	24.65
East. Penn., sil. 2.25 to 2.75	25.15
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
Ala., sil. 1.75 to 2.25	21.41 to 23.27
Ala., sil. 2.25 to 2.75	21.91 to 23.77

Freight rates: $4.91 all rail from Buffalo, and $4.28 rail and water; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.

*All rail rate.
†Rail and water rate.

Reinforcing Bars.—Current business in billet steel bars is confined to small tonnages, yet the weekly aggregate was satisfactory. Prices hold well at 2.66½c. a lb., base, from stock. The largest individual prospect is 100 tons for a local institution addition, but it is expected that a new bankers' building will soon require 1000 tons or more. The market for rail steel bars has become rather listless, with prices nominal at 2.26½c., base, delivered common Boston freight rate points.

Shapes and Plates.—Fabricators of shapes and plates are now well covered on material for third quarter. Plate deliveries are still backward, while those of standard shapes are generally on schedule. Contracts placed with structural steel fabricators the past week were few. It is expected that about 1000 tons for various bridges will be closed this week. A Congress Street (Boston) bridge, involving 1000 tons or more, will soon come up for figures.

Cast Iron Pipe.—Hopkinton, Mass., has bought 1000 tons of pipe from the United States Pipe & Foundry Co., and it is reported that 300 tons of 6 and 8-in. stocks has been placed with a French foundry for a water line between Hyannis and Craigville, Mass. Weston, Mass., will close bids July 23 for 400 tons of 6 to 12-in. pipe. Some of the usually active foundries will not bid on the 4500 tons of 36 and 42-in. pipe wanted by West Hartford, Conn., as they are well sold ahead on these sizes. Prices quoted openly on domestic pipe are: 4 in., $46.10 to $47.10 a ton, delivered common Boston freight rate points; 6 to 12 in., $40.10 to $41.10; 16 to 20 in., $39.10. A $3 differential is asked on Class A and gas pipe.

Coke.—Specifications against last half by-product foundry coke contracts are increasing slowly. The price of such fuel remains at $11 a ton, delivered within a $3.10 freight rate zone.

Old Material.—Old material in general is scarce. Prices for available scrap wanted by Pennsylvania mills are higher. While $12 to $12.50 a ton on cars shipping point is the general price for No. 1 heavy melting steel, $12.75 was paid the past week. Steel turnings range from $6.60 to $7.10 a ton, as against $6.60 generally, a week ago, while dealers in most cases are paying slightly better prices for forge flashings, forge scrap and steel axles. The best most dealers will do on axles is $18 a ton, on cars, yet $18.50 and as high as $19 have been paid recently under special conditions. Railroad malleable is in demand, with $18.50 a ton, delivered, the common quotation. Specification pipe is the one material dealers cannot sell. Exporters are endeavoring to load the Norwegian steamer Karmoy with scrap for Danzig, but material is scarce. The Boston & Maine Railroad yesterday closed bids on approximately 65 cars of various kinds of scrap.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $12.75
Scrap T rails	11.50 to 12.00
Scrap girder rails	10.50 to 11.25
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought	9.50 to 10.00
Machine shop turnings	6.60 to 7.10
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	9.50 to 10.25
Forge flashings	10.25 to 10.50
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	9.00 to 9.25
Shafting	14.00 to 14.25
Steel car axles	17.50 to 18.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.75 to 10.00
Rails for rolling	12.50 to 12.75
Cast iron borings, chemical	10.00 to 10.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$14.50 to $14.75
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.50 to 12.00
Railroad malleable	18.50 to 19.00

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Spares and flats	*4.05c. to 7.05c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Canada

Canadian Pacific to Buy More Cars

TORONTO, ONT., July 16.—The Canadian Pacific is taking bids on 31 freight and passenger locomotives, 121 sleeping and passenger cars, 1411 stone, coal, ore and flat cars, 300 freight and express refrigerator cars and 200 steel-sheathed automobile cars.

Pig Iron.—The summer holiday season is taking toll of business in this market. Forward delivery buying has practically ceased, following the active buying movement which terminated about a week ago. Spot sales are fairly numerous, but in small lots. Shipments are going forward in large tonnage. Canadian pig iron prices are firm, but unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$24.60
No. 2 fdy., sil. 1.75 to 2.25	24.10
Malleable	24.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$26.00
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	24.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel.—While there is a strong prospective demand for structural steel in connection with new building undertakings, actual sales

for the week were much below the weekly average for this year. New business was made up chiefly of lots under 500 tons. Inquiries and specifications are out, however, for substantial tonnages on which early closing is expected. Fabricating plants in Canada are running at full time, with backlogs sufficient to maintain present activities for several months.

Old Material.—Consumers continue to withhold new business from the old material markets. Current sales are mostly confined to spot needs of the small consumers, with little or no forward delivery buying. Prices are firm, but unchanged.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$10.00	$8.50
Rails, scrap	11.00	9.00
No. 1 wrought	10.00	12.00
Machine shop turnings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings	7.50	5.00
Steel turnings	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast	....	17.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 mach'ry cast	$16.00	....
Stove plate	12.00	....
Standard carwheels	15.00	....
Malleable scrap	14.00	....

Buffalo

Pig Iron Inquiry Totals 10,000 Tons

BUFFALO, July 16.—While a great many pig iron consumers are inactive in the purchasing departments because of inventory taking, a buying movement appears to have begun for the third quarter. A Batavia melter wants 1500 tons of foundry, and in the East several sizable inquiries are pending. Three of these embrace about 7000 tons of foundry and are respectively 3500 tons, 2000 tons and 1500 tons. A few small lots are being sold in the district at $19.50 for No. 2 plain. Producers estimate the total inquiry for the week at about 10,000 tons. Prices in the district are firm.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$19.50
No. 2X fdy., sil. 2.25 to 2.75	20.00
No. 1 fdy., sil. 2.75 to 3.25	21.00
Malleable, sil. up to 2.25	20.00
Basic	18.50
Lake Superior charcoal	27.28

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb	3.75

Finished Iron and Steel.—Most of the mills continue to operate at from 90 to 95 per cent of capacity. The fabricated structural market has been quite active and some very good business has been placed, including 1000 tons for a physical culture building at Rochester University; the Woodrow Wilson School at Binghamton, 200 tons; building for the Carborundum Co., Niagara Falls, 200 tons; bridges for the Youngstown-Olcott highway, 250 tons. Fabricators are awaiting action on the 8000-ton City Hall job. Bids go in July 19 for the 1600-ton Batchellerville viaduct north of Schenectady.

Old Material.—Strengthening of the market outside of Buffalo is reflecting itself here, though there has been no large buying movement. Some small tonnages of No. 1 heavy melting steel have been sold, and the market is strong at $17.25. There has been a little buying of No. 1 machinery cast scrap by some of the smaller consumers at $15.50 to $16. Railroad lists closed last week included No. 1 heavy melting steel, which brought $17.25, delivered Buffalo consuming plant. There is a shortage of knuckles and couplers and rolled steel wheels for this district. Prices offered are $21.00 to $21.50, Pittsburgh district points, against $19.00 to $19.50, Buffalo.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades		
No. 1 heavy melting steel	$17.00 to	$17.25
No. 2 heavy melting steel	14.75 to	15.00
Scrap rails	16.50 to	17.00
Hydraul. comp. sheets	14.50 to	14.75
Hand bundled sheets	12.00 to	12.50
Drop forge flashings	14.75 to	15.00
No. 1 busheling	15.50 to	16.50
Hvy. steel axle turnings	14.00 to	14.50
Machine shop turnings	7.50 to	7.75
No. 1 railroad wrought	13.00 to	13.50
Acid Open-Hearth		
Knuckles and couplers		19.00
Coil and leaf springs		19.00
Rolled steel wheels		19.00
Low phos. billet and bloom ends	20.00 to	20.50
Electric Furnace Grades		
Short shov. steel turnings	12.00 to	12.50
Blast Furnace Grades		
Short mixed borings and turnings	11.00 to	11.50
Cast iron borings	11.00 to	11.50
No. 2 busheling	10.00 to	10.50
Rolling Mill Grades		
Steel car axles	18.75 to	19.25
Iron axles	21.00 to	22.00
Cupola Grades		
No. 1 machinery cast	16.00 to	17.00
Stove plate	12.50 to	13.00
Locomotive grate bars	12.50 to	13.00
Steel rails, 3 ft. and under	19.00 to	19.50
Cast iron carwheels	14.00 to	14.50
Malleable Grades		
Industrial	18.50 to	19.00
Railroad	18.50 to	19.00
Agricultural	18.50 to	19.00
Special Grades		
Chemical borings	12.50 to	13.50

St. Louis

Pig Iron Sold for Last Quarter—Southern Price Situation Restricts Buying—Scrap Steady

ST. LOUIS, July 16.—The first sales of pig iron for fourth quarter shipment were reported this week by the St. Louis Gas & Coke Corporation—500 tons to a St. Louis jobbing foundry and 200 tons to a Kansas City melter. Current prices prevailed. Total sales of that maker for the week were 5000 tons, including 500 tons to a Belleville stove plant, 500 tons to each of two Iowa foundries, 300 tons to a Kansas City specialty maker and 200 tons to an Oklahoma melter, all for third quarter. Melters generally are buying only for immediate requirements, apparently being uncertain as to the future because of the recent reductions by Southern makers. The local maker's quotations are unchanged, although it is understood prices in competitive territory are being met in some instances.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	18.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Finished Iron and Steel.—The Granite City Steel Co. reports an improvement in the demand for galvanized sheets, while demand for plates and blue annealed sheets continues brisk. Prices in all lines are being generally well maintained. While no large structural projects are being undertaken, steel fabricators report that there has been a marked improvement in the number of small contracts, which have reached a fairly large volume.

Old Material.—An improvement in both inquiries and shipments during the last week is reported. The amount of old material reaching this market

Production and Shipment of Raw Materials and Finished Products in May

	May, 1929	April, 1929	May, 1928
Sheet-Metal Ware (a):			
Galvanized, produced, dozens	219,992	220,933	216,376
Galvanized, shipped, dozens	189,098	227,354	190,704
Galvanized, shipped, value	$748,831	$882,608	$758,953
Enameled, shipped, dozens	352,885	463,577	348,661
Enameled, shipped, value	$1,309,747	$1,420,535	$1,304,498

(a) United States Department of Commerce.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	3.95c.
Boiler rivets	3.95c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb	50

from the country dealers is still small because the heat has interfered with handling. Railroad shipments also are light for the same reason. Consumers are said to be willing to buy at present quotations, but dealers are cautious about taking such business. Prices are unchanged. Railroad lists: Santa Fe, 7250 tons; Rock Island, 6500 tons; Burlington, 6477 tons; Chesapeake & Ohio, 4951 tons; Louisville & Nashville, 2330 tons; Missouri-Kansas-Texas, 710 tons; Nickel Plate, 29 carloads; Frisco, 26 carloads; Pullman, six carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$13.50 to $14.00
No. 2 heavy melting or shoveling steel	12.75 to 13.25
No. 1 locomotive tires	15.00 to 15.50
Miscel. stand-sec. rails including frogs, switches and guards, cut apart	15.50 to 16.00
Railroad springs	17.00 to 17.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	13.50 to 14.00
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	15.00 to 15.50
Rails for rolling	16.00 to 16.50
Machine shop turnings	8.00 to 8.50
Heavy turnings	9.75 to 10.00
Steel car axles	19.00 to 19.50
Iron car axles	26.50 to 27.00
Wrot. iron bars and trans.	22.00 to 22.50
No. 1 railroad wrought	13.00 to 13.50
Steel rails, less than 3 ft.	17.50 to 18.00
Steel angle bars	14.25 to 14.75
Cast iron carwheels	14.00 to 14.50
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	15.50 to 16.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	12.50 to 13.00
Agricult. malleable	15.00 to 15.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c
Blue ann'l'd sheets (No. 10)	3.45c
Structural rivets	3.85c
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg	2.85
Cement c't'd nails, base 100 lb. keg	2.85
Chain per 100 lb	3.75
	Net per 100 Ft.
Lap-weld steel boiler tubes, 2-in.	$16.00
4-in.	33.00
Seamless steel boiler tubes, 2-in.	17.00
4-in.	34.00

Cincinnati

Southern Pig Iron Weaker But Demand is Light—Cold Rolled Strip Sales Drop Sharply

CINCINNATI, July 16.—District consumers of Northern pig iron are continuing to go slowly in anticipating their needs and are buying only enough material to keep covered for 30 to 60 days. Consequently, new business, although in better volume than is usual in midsummer, is confined chiefly to purchases in small lots. Except for an inquiry from a Springfield, Ohio, melter for 400 to 500 tons, most of the quantities asked for range from 100 to 300 tons. In contrast with this fair activity in Northern iron, Southern iron continues dull and weak. The quoted price is $14.50, base Birmingham, but substantial concessions would undoubtedly be made on quantity orders. Silvery iron, which has been quiet for some time, has declined $1, bringing the new base price to $25.

Prices per gross ton, del'v'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.39
Ala. fdy., sil. 1.75 to 2.25	18.19
Ala. fdy., sil. 2.25 to 2.75	18.69
Tenn. fdy., sil. 1.75 to 2.25	18.19 to 18.69
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Coke.—Except for an order from an Indiana consumer to cover his needs for the next nine months, new business in foundry coke has been light. On the other hand, specifications against current contracts during the first two weeks of July have advanced slightly over the corresponding period in June, and indications are that consumers will take more coke this month on contract.

Finished Material.—Although demand failed to keep pace with production last week, causing a reduction in backlogs, district sheet mills have sufficient unfilled orders to maintain capacity output into late summer. One exception to this, however, must be noted. Cold rolled strip has slumped sharply, following the withdrawal of automobile manufacturers from the market. The fabricated material market continues dull, although several large undisclosed projects are reported to be under consideration. Except for these reports, the market generally is very quiet and current business is at a hand-to-mouth rate.

Old Material.—Although the mills are using large amounts of scrap, trading in old material is confined to carload lots. Despite this dullness a continued scarcity of good scrap has given the market an undertone of firmness and consequently prices have been maintained.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$13.25 to $13.75
Scrap rails for melting	13.75 to 14.25
Loose sheet clippings	9.25 to 9.75
Bundled sheets	10.50 to 11.00
Cast iron borings	9.00 to 9.25
Machine shop turnings	8.50 to 8.75
No. 1 busheling	10.50 to 11.00
No. 2 busheling	6.75 to 7.00
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	13.00 to 13.50
Short rails	18.50 to 19.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	19.25 to 19.75
No. 1 railroad cast	15.25 to 15.75
Burnt cast	10.26 to 10.75
Stove plate	10.25 to 10.75
Brake shoes	10.25 to 10.75
Railroad malleable	15.25 to 15.75
Agricultural malleable	14.25 to 14.75

Detroit

Seasonal Decline in Automobile Production Will Be Less Than Usual This Year

DETROIT, July 16.—While the seasonal decline in automobile production is now apparent, it will be less than usual this year. Figures for June so far obtainable show that virtually all makers except Packard are affected. Packard in June built more cars than in May.

The low-priced cars are still holding the field for volume. Ford set a new daily record during June with a production averaging 9100 units.

It is believed in some quarters that the heavy sales of Ford cars have had a tendency to slow up sales of used cars generally, which of course is re-

ESTIMATED AUTOMOBILE PRODUCTION FOR JULY
(Actual Figures for May and June Shown)

	May	June	July (Estimated)
Auburn	3,032	3,144	2,500
Buick	12,000	14,665	31,408
Cadillac and LaSalle	4,200	1,842	1,500
Chevrolet	160,895	151,297	150,000
Chrysler	54,595	42,351	25,000
Ford	200,903	177,419	175,000
Franklin	1,707	1,405	1,200
Graham-Paige	11,677	5,987	4,500
Hudson and Essex	42,086	31,737	28,000
Hupmobile	5,329	2,030	1,800
Nash	12,117	9,070	8,000
Oldsmobile and Viking	16,000	7,361	6,000
Packard	4,561	4,753	4,600
Reo	4,453	3,042	2,800
Studebaker	14,000	.....	9,000
Willys Overland	35,000	30,000	25,000

flected in the disposal of new cars in the medium-priced field.

While June figures are below those of May, this year, they show a gain of approximately 26 per cent over the output in June, 1928, and it seems reasonable that production this month will be at a corresponding ratio over the total for July last year.

New car stocks held by dealers are ahead of retail demand, but the margin is said to be satisfactorily small.

Although the demand for structural steel shows a recession, the decrease is of small consequence. Proposed new work includes a theater at Battle Creek, Mich., an armory for the Naval Reserve in Detroit, an automobile sales and service building in Detroit and a store and office building in Detroit, which together will require 1000 tons or more of steel.

Old Material.—There have been no sales involving any tonnage during the past week and prices remain same as quoted last week.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$14.00 to $14.50
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	12.50 to 13.00
Automobile cast	13.00 to 13.50
Hydraul. comp. sheets	13.75 to 14.25
Stove plate	9.00 to 9.50
New No. 1 busheling	12.50 to 13.00
Old No. 1 busheling	11.00 to 11.50
Sheet clippings	8.75 to 9.25
Flashings	12.75 to 13.25

Fabricated Structural Steel

Fresh Inquiries Are Largest of Year—Chicago Work Will Take 25,000 Tons

OF the 26,000 tons of structural steel lettings in the past week, approximately 40 per cent was for non-industrial projects, 25 per cent for bridge work, 20 per cent for industrial purposes and the remainder for miscellaneous jobs. It is interesting to note that more than 15,000 tons represented building activities in New England, New York and New Jersey.

Fresh inquiries, totaling more than 74,000 tons, were the largest this year. Construction work in Chicago will take about 25,000 tons, or about 30 per cent of the tonnage which came out during the week. Plans for bridges are being pushed in various parts of the country, pending jobs include 20,000 tons for that purpose.

The outstanding award was 5800 tons for a bridge over the Hackensack River in New Jersey. Among the larger inquiries are 15,000 tons for an Ohio River bridge, 14,000 tons of plates for a pipe line at Phoenix, Ariz., and 12,000 tons for an office and theater building at Chicago. Awards follow:

CAMBRIDGE, MASS., 100 tons, garage, to New England Structural Co.

STAMFORD, CONN., 500 tons, department store, to A. E. Norton, Inc.

NEW YORK, 2000 tons, Goldman-Sachs Building on Pine Street, to American Bridge Co.

NEW YORK, 2200 tons, County Trust Co. building, to A. E. Norton, Inc.

NEW YORK, 500 tons, apartment building on Seventy-ninth Street, to Paterson Bridge Co.

NEW YORK, 500 tons, apartment building on Park Avenue, to Paterson Bridge Co.

NEW YORK, 900 tons, public school No. 141, to Harris Structural Steel Co.

NEW YORK, 150 tons, building for New York Central Railroad at 161st Street and Morris Avenue, to unnamed bidder.

BROOKLYN, 1200 tons, printing building for *Brooklyn Daily Eagle*, to George A. Just Co.

NORTH BEACH, N. Y., 425 tons, two airplane hangars, to McClintic-Marshall Co.

STATE OF NEW JERSEY, 5800 tons, bridge over Hackensack River, to Strobel Steel Construction Co.

ROCHESTER, N. Y., 1000 tons, physical education building for University of Rochester, to McClintic-Marshall Co.

BINGHAMTON, N. Y., 200 tons, Woodrow Wilson School, to McClintic-Marshall Co.

STATE OF NEW YORK, 250 tons, bridges over Youngstown-Olcott Highway, to McClintic-Marshall Co.

PHILADELPHIA, 200 tons, warehouse in Frankford, to R. E. Lederle, Philadelphia.

BELLE, W. VA., 225 tons, extension to generator plant for Du Pont Engineering Co., to Virginia Bridge & Iron Co.

STATE OF NEW YORK, 118 tons, State highway bridge at Dunkirk, N. Y., to McClintic-Marshall Co.

ST. JOSEPH, MICH., 920 tons, foundry for Auto Specialties Mfg. Co., to Flint Structural Steel Co.

TORONTO, ONT., 150 tons, warehouse on Fleet Street, to Reid & Brown Structural Steel & Iron Works.

PITTSBURGH, 300 tons, Melwood Avenue garage, to Jones & Laughlin Steel Corporation.

STATE OF WEST VIRGINIA, 200 tons, two State highway bridges, to Pittsburgh-Des Moines Steel Co.

DAYTON, OHIO, 600 tons, steam station for Dayton Power & Light Co., to Dayton Structural Steel Co.

ROCK ISLAND, ILL., 750 tons, addition to motor building for International Harvester Co., to Gage Structural Steel Co., Chicago.

ROCK ISLAND, 200 tons, addition to power house for International Harvester Co., to Rock Island Bridge Co.

CHICAGO, 770 tons, Trustee System Building at Lake and Wells Streets, to Duffin Iron Co., local.

CHICAGO, 600 tons, Dallas Brass & Copper Co., to Hansell Elcock Co., local.

CHICAGO & WESTERN INDIANA RAILROAD, 825 tons, subway at Chicago, to American Bridge Co.

STATE OF IOWA, 150 tons, highway bridges in Cass County, to St. Joseph Structural Steel Co., St. Joseph, Mo.

MESA, ARIZ., 250 tons, taintor gates, Stewart Mountain dam, to unnamed bidder.

ELLENSBURG, WASH., 257 tons, crossing, Yakima River, to unnamed bidder.

SEATTLE, 160 tons, City-County Building addition, to Isaacson Iron Works.

SEATTLE, 110 tons, Boeing Airplane Co. hangar, to Isaacson Iron Works.

PULLMAN, WASH., 300 tons, field house for Washington State University, to unnamed bidder.

BERKELEY, CAL., 325 tons, infirmary for University of California, to California Steel Co.

SACRAMENTO, 630 tons, bridge over Salinas River, to unnamed fabricator.

SAN FRANCISCO, 300 tons plates and shapes, barge for Santa Fe Railroad, to Moore Dry Dock Co.

SAN FRANCISCO, 950 tons, apartment, O'Farrel Street near Leavenworth Street, to McClintic-Marshall Co.

ST. ARDO, CAL., 650 tons, highway bridge, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

BOSTON & ALBANY RAILROAD, 500 tons, roundhouse at Boston.

NEW YORK, 4000 tons, building on Eighteenth Street for New York Telephone Co.

NEW YORK, 8300 tons, subway, route 107; contract awarded.

ATLANTIC CITY, N. J., 2000 tons, hotel.

GERMANTOWN, PA., 200 tons, Germantown Trust Co. building.

HARRISBURG, PA., unstated tonnage, soldiers' and sailors' memorial bridge.

PHILADELPHIA & READING RAILROAD, 300 tons, bridge work.

SCHENECTADY, N. Y., 1600 tons, Batchellerville viaduct; bids July 19.

BUFFALO, 200 tons, Erie County bridge.

TOLEDO, tonnage unstated, Maumee River bridge for city of Toledo.

AKRON, OHIO, 100 tons, Northwest office building for Ohio Bell Telephone Co.

MCKEES ROCKS, PA., 15,000 tons, bridge across Ohio River; plans not yet completed.

PITTSBURGH, 300 tons, two tow boats for Inland Waterways Corporation.

PITTSBURGH, 1300 tons, recreation building for H. J. Heinz Co.

MIDDLETOWN, OHIO, 300 tons, new building for Middletown Bank & Deposit Co.

CINCINNATI, 500 tons, six scows for United States Engineer; bids close July 17.

LOUISVILLE & NASHVILLE RAILROAD, 900 tons, office building at Louisville.

BIG FOUR RAILROAD, 2000 tons, bridge at Terre Haute, Ind.

CHICAGO, 1000 tons, building for Edison Electric Appliance Co.; previously reported at 600 tons.

CHICAGO, 6000 tons, International Tower; previously called Machinery Mart.

CHICAGO, 12,000 tons, office and theater on Wacker Drive.

CHICAGO, 6000 tons, Garret Biblical Institute Building.

CHICAGO, 2300 tons, Parker High School; Hansell Elcock Co. reported low bidder.

PRINCETON, WIS., 250 tons, Fox River bridge; bids close July 25.

MILWAUKEE, 110 tons, Newburg bridge in Washington County; bids close July 24.

PHOENIX, ARIZ., 14,000 tons plates, pipe line, ¼-in. plate material; preliminary bids being taken.

NEWPORT BEACH, CAL., 150 tons, bridge for improvement of Lido Island; bids July 15.

SEATTLE, 10,000 tons plates, 48-in. riveted pipe, Cedar River Pipe Line; bids postponed from July 5 to July 19.

WEST VANCOUVER, B. C., 800 tons, bridge over Capilano River for British Columbia Department of Public Works.

Non-Ferrous Metal Markets

Tin Prices Advance, Copper Quiet, Lead Declines, Zinc Slow

NEW YORK, July 16.

Tin.—The market has shown increasing strength during the past week. It is conservatively estimated that sales of Straits tin amounted to 1900 tons, the largest single week's business in the last month. The bulk of the buying has been done by consumers, and an unusual feature is the fact that some of the orders were for delivery as far ahead as February of 1930. The announcement of the formation of a British producers' association, looking toward the rationalization of the tin market, had a sentimental effect on business, but beyond that it had no special influence. Much discussion has arisen from the purchase by Patino Mines & Enterprises, Consolidated, of the interests of the National Lead Co. and of Simon I. Patino in the tin smelting plant of Williams, Harvey & Co., Ltd. Some observers believe that the deal will open the way for the Patino company to join the British producers' group in attempting to stabilize the market. Others argue, however, that no special significance should be attached to the transaction, since the National Lead Co. still owns a large block of stock in the Patino company, and therefore the sale is little more than a bookkeeping arrangement. Prices advanced steadily during the week from 45½c. to 47¼c. Spot metal, however, continues to sell at a discount of about 1c. a lb. The biggest day of the week was Monday, July 15, when 700 tons was sold. Spot Straits tin is quoted today at 47¼c., New York. The formal announcement of the organization of British producers resulted in a sharp increase in prices abroad, which are about £9 a ton higher than a week ago, with spot standard quoted at £213 15s., future standard at £217 7s. 6d. and spot Straits at £217 5s. Free selling in the East is noted, and the Singapore price today was £219 15s.

Copper.—While statistics for June show that stocks of refined copper increased about 12,700 tons, this was offset by a decline in blister output amounting to approximately 18,000 tons. The prevailing opinion in the trade is that these figures reveal an improvement in the market, and predictions are that the month of July will bring a reduction in refined stocks, thereby further strengthening the position of producers. Sellers find en-

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	July 16	July 15	July 13	July 12	July 11	July 10
Lake copper, New York	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	47.25	46.55	....	45.62½	45.75	45.50
Zinc, East St. Louis	6.70	6.70	6.70	6.70	6.70	6.70
Zinc, New York	7.05	7.05	7.05	7.05	7.05	7.05
Lead, St. Louis	6.55	6.55	6.55	6.55	6.55	6.55
Lead, New York	6.75	6.75	6.75	6.75	6.75	6.75

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Rolled Products

Prices on rolled non-ferrous products are unchanged from those prevailing one week ago.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
- High brass ..... 23.25c.
- Copper, hot rolled ..... 26.75c.
- Zinc ..... 10.25c.
- Lead (full sheets) ... 11.00c. to 11.25c.

Seamless Tubes—
- High brass ..... 28.25c.
- Copper ..... 29.25c.

Rods—
- High brass ..... 21.25c.
- Naval brass ..... 24.00c.

Wire—
- Copper ..... 19.87½c.
- High brass ..... 23.75c.

Copper in Rolls ..... 26.75c.
Brazed Brass Tubing 30.87½c

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 33.00c.
Tubes, base ..... 42.00c.
Machine rods ..... 34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.00c.
Lead, wide	11.90c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	21.12½c. to 22.12½c.
Copper, hot rolled, base sizes	27.75c. to 28.75c.
Copper, cold rolled 14 oz. and heavier, base sizes	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brazed Brass Tubes	29.12½c. to 30.12½c.
Brass Rods	18.87½c. to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	48.00c. to 49.00c.
Tin, bar	50.00c. to 51.00c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	19.00c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	7.50c. to 8.00c.
Lead, bar	9.50c. to 10.00c.
Antimony, Asiatic	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy,	24.00c. to 25.00c.
Babbitt metal, commercial grade,	30.00c. to 40.00c.
Solder, ½ and ½	30.50c. to 31.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	50.75c.
Tin, bar	52.75c.
Copper, Lake	19.50c
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab	7.75c. to 8.00c.
Lead, American pig	7.50c. to 7.75c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	18.75c.
Babbitt metal, high grade	54.75c.
Solder, ½ and ½	31.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	14.50c.	16.00c.
Copper, hvy. and wire	14.25c.	15.625c.
Copper, light and bottoms	12.50c.	13.50c.
Brass, heavy	8.50c.	9.50c.
Brass, light	7.50c.	8.50c.
Hvy. machine composition	11.50c.	12.75c.
No. 1 yel. brass turnings	9.50c.	10.25c.
No. 1 red brass or compos. turnings	11.25c.	12.25c.
Lead, heavy	5.50c.	5.75c.
Lead, tea	4.25c.	5.25c.
Zinc	3.50c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	12.25c.	14.25c.

couragement in the fact that British importations of copper in June were 4 per cent greater than those of May. So far as buying is concerned, the past week was quiet, and sales averaged about 500 tons a day, against 1000 tons in the previous week. Most of the activity was confined to the export trade, domestic consumers having practically withdrawn from the market. Current reports are that the price of electrolytic copper is about to decline sharply. Producers declare emphatically, however, that these statements are propaganda of interests which are manipulating copper stocks on the New York Stock Exchange. They point out that quotations have held for several months in the face of an absence of buying and that nothing would be gained by concessions now. Therefore, quotations are unchanged at 18c., delivered in the Connecticut Valley, and at 18.30c., c.i.f. usual European ports. Lake copper is firm at 18c. to 18.12½c., delivered. Copper users apparently are letting stocks diminish to the vanishing point before placing further orders, and producers are confident that there must be a resumption of buying on at least a moderate scale in the near future.

Lead.—The American Smelting & Refining Co. reduced its price on Wednesday, July 10, to 6.75c., New York. This was followed immediately by a drop in quotations of the principal factor in the West to 6.60c., St. Louis, and later to 6.55c., St. Louis. Orders have been of fair volume.

Zinc.—Dullness persisted in prime Western zinc during the past week, but inquiries which appeared today indicate that there may be at least a slight pickup in business. Prices continue to range from 6.70c. to 6.80c., East St. Louis. There has not been sufficient business in the last few days, however, to make a real test of quotations. Companies which have been adhering to 6.80c. are holding to that figure and are getting a fair share of the orders.

Antimony.—The depression, noted a week ago, has continued with the result that holders of Chinese metal have been offering it at concessions. The present price is 8.25c. for spot and 8.50c. for futures, duty paid, New York.

Nickel.—Ingot nickel is quoted at 35c. a lb., with shot nickel at 36c. and cathodes of electrolytic nickel at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is selling at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, July 16.—The tin market is active and prices have advanced sharply. Quotations for zinc and antimony are lower. Sales in the old metals are scattered and in small volume.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 47.40c.; lead, 6.85c.; zinc, 6.65c.; in less-than-carload lots, antimony, 9.25c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 24.50c.; tin foil, 26c.; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

Railroad Equipment

New York to Buy 300 Cars for Subway Service

DULLNESS continues in the railroad equipment market. Scarcity of orders and inquiries for locomotives and cars indicate a present lack of interest on the part of carriers. The Rio Grande do Sul, Brazil, is asking for bids on 80 steel underframe box cars, 50 steel ballast cars and 21 passenger cars, while the New York City Board of Transportation is expected to buy 300 steel passenger cars for subway service. The Burlington is in the market for 25 locomotives. Details of the week's business follow:

New York City Board of Transportation is asking for bids by Aug. 20 on 300 steel passenger cars for subway service.

Hercules Cement Co. has ordered 10 cement cars from Standard Steel Car Co.

Warren Tank Car Co. has ordered five tank cars from Standard Steel Car Co.

Rio Grande do Sul, Brazil, is asking for prices on 80 steel underframe box cars and 50 steel ballast cars, also 21 passenger cars.

New York Central has ordered 75 express refrigerator cars from Merchants Despatch Transportation Co.

Great Northern has ordered two dining cars from Pullman Car & Mfg. Corporation.

Minneapolis & St. Louis has ordered three gas-electric motor cars from St. Louis Car Co.

Illinois Central has ordered five 600-hp. oil-electric locomotives from Ingersoll-Rand Co. and General Electric Co.

Northern Pacific will buy 11 2-8-8-2 locomotives.

Great Northern is in the market for 12 4-8-4 locomotives.

Texas Pacific will purchase five Mountain-type engines.

International Harvester Co. has placed 13 side dump cars with Pressed Steel Car Co.

Chicago, Burlington & Quincy is contemplating purchase of 25 locomotives.

Detroit & Toledo Shore Line will buy six Mikado locomotives.

Pere Marquette is considering the purchase of 10 coaches.

Ten open all-steel trolley cars have been bought in the United States by Bogota, capital of Colombia, Commercial Attache Walter J. Donnelly, Bogota, reports to the Department of Commerce. The cars, which accommodate 60 passengers each, increased the number of street cars in Bogota to 100, all of United States manufacture. They are operated by the Compania Tranvia Municipal de Bogota.

Reinforcing Steel

New Projects of 5700 Tons Largest Since March—Awards Total 3200 Tons

THE total of new projects, about 5700 tons, was the largest of any week since March. Outstanding was 2100 tons for the Ohio River boulevard in Pittsburgh, 900 tons for approaches to the Ohio River bridge at McKees Rocks, Pa., and 800 tons for track elevation of the Chicago, Milwaukee & St. Paul Railroad in Chicago. Awards of the week totaled about 3200 tons, of which the largest was 600 tons for an apartment building in Chicago. Awards follow:

NEW YORK, 200 tons, barracks at Mitchel Field, to Igoe Brothers.

CHICAGO, 600 tons, apartment building at 1100 North Dearborn Street, to Calumet Steel Co.

CLEVELAND, 250 tons, Union Terminal work, to Pollak Steel Co.

CLEVELAND, 100 tons, East Fifty-fifth Street bridge for Nickel Plate Railroad, to Bourne-Fuller Co.

CHICAGO, 160 tons, International Ink Co., to Calumet Steel Co.

GRAND TRUNK RAILROAD, 400 tons, to an unnamed bidder.

WALLA WALLA, WASH., 100 tons, women's prison building, to Northwest Steel Rolling Mills.

OLYMPIA, WASH., 300 tons, highway work, to Northwest Steel Rolling Mills.

SEATTLE, 150 tons, apartment building and school in Olympia, to Northwest Steel Rolling Mills.

SACRAMENTO, 120 tons, bridge in Sacramento County, to unnamed bidder.

SACRAMENTO, 256 tons, bridge over Salinas River, to unnamed bidder.

SACRAMENTO, 416 tons, bridge over Cottonwood Creek, to unnamed bidder.

SACRAMENTO, 133 tons, paving in Madera County, to unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

BOSTON, 100 tons, Perkins Institute for Blind Industrial House.

DELAWARE, LACKAWANNA & WESTERN RAILROAD, 300 tons.

NEWARK, N. J., 350 tons, garage.

PHILADELPHIA, 300 tons, hospital building for Woman's Medical College.

PITTSBURGH, 2100 tons, Ohio River Boulevard; Booth & Flinn, Ltd., general contractor.

MCKEES ROCKS, PA., 900 tons, approaches for Ohio River bridge; Dravo Contracting Co., general contractor.

CINCINNATI, 200 tons for Rubel Baking Co.; bids July 27.

CINCINNATI, 375 tons, new plant for Mosby Medicine Co.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC, 800 tons, track elevation at Chicago; Thorgensen & Erickson, general contractors.

PHOENIX, ARIZ., 163 tons, paving and 14 bridges, Douglas-Rodeo Highway; bids opened.

ELLENSBURG, WASH., 143 tons, North Branch Canal project; division No. 2, bids Aug. 9.

PERSONAL

R. W. PROCTER, formerly of the Black & Decker Mfg. Co., Towson, Md., has been appointed general sales manager of the Van Dorn Electric Tool Co., Cleveland, which is a subsidiary of the Black & Decker company. He succeeds LYMAN H. BELLOWS, who recently resigned.

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HERBERT W. SMITH, formerly in charge of selling scrap for the Hudson Motor Car Co., has become vice-president of Samuel G. Keywell Co., Detroit, scrap dealer.

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WARREN C. WEBB has been appointed Pacific Coast sales manager, with offices at 443 East Third Street, Los Angeles, for the W. A. Jones Foundry & Machine Co., Chicago.

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R. C. BROWER, heretofore general manager of the Timken Roller Bearing Service & Sales Co., Canton, Ohio, has been appointed assistant secretary and assistant treasurer of the Timken Roller Bearing Co., and he is being succeeded by W. H. RICHARDSON, formerly manager of the New York office of the Service & Sales Company. E. H. AUSTIN, manager of the Kansas City branch, becomes manager of the New York office and L. J. HALDERMAN, manager of the office at Atlanta, Ga., has been made manager at Kansas City. PARKER T. ANCARROW, of the Richmond, Va., branch, succeeds Mr. Halderman at Atlanta, and STEWART B. ANCARROW becomes manager at Richmond.

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HUGH SCOTT has been placed in charge of the St. Louis office of the Union Chain & Mfg. Co., Sandusky, Ohio, and A. R. YOUNG heads the Indianapolis office of the company.

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R. N. JESSOP, formerly Chicago district sales manager, motor department, of the Ohio Electric & Controller Co., Cleveland, has been appointed sales engineer of the company with office at Cleveland.

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ARTHUR D. LITTLE, president, Arthur D. Little, Inc., Cambridge, Mass., delivered his presidential address on "Science and Labor" before the Society of Chemical Industry, London, at Manchester, England, July 9. He has been awarded the honorary degree of Doctor of Science from the University of Manchester and Honorary Associateship in the Manchester College of Technology.

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WILLIS L. KING, vice-president, Jones & Laughlin Steel Corporation, Pittsburgh, was honored by 80 executives and department heads of the company on July 12 by a dinner at the Pittsburgh Golf Club in observance of the completion of 60 years of service with the company. G. M. LAUGHLIN, JR., chairman of the board of the company, presided and Mr. King was presented with a platinum watch, suitably engraved.

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R. H. MADDOCKS, New York district sales manager of the Central Iron & Steel Co., Harrisburg, Pa., will sail July 19 on the Olympic for six weeks European trip. He will visit France, England and Scotland.

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J. G. BELDING, for the past 11 years general manager of the Lombard Iron Works & Supply Co., Augusta, Ga., at the annual meeting of the board of directors on July 3, was elected president of the corporation. He succeeds the late GEORGE R. LOMBARD, founder of the company. Mr. Belding is vice-president of the Southern Metal Trades Association and past president of the Southern Supply and Machinery Dealers' Association.

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W. H. WARREN, general superintendent of the plant of the Lukens Steel Co., Coatesville, Pa., has been elected vice-president in charge of operations. A vacancy in the office of vice-president occurred recently when HORACE B. SPACKMAN became chairman of the executive committee. HUGH KENWORTHY succeeded Mr. Spackman as manager of purchases.

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W. TRINKS, professor of mechanical engineering at the Carnegie Institute of Technology, Pittsburgh, has left for an extended trip of investigation in Europe this summer.

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WILLIAM C. DICKEY, New York sales agent for the Worth Steel Co., the Thomas Steel Co. and the New Haven Copper Co., will sail July 26 on the Ile de France for Europe. He will visit England, France, Switzerland and Italy, sailing from Naples on the Conte Grande on Aug. 31.

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J. R. POYSER plans to sever his connection with Doelger & Kirsten, Milwaukee, Sept. 1. From 1910 to July, 1922, he was connected with the Canton Foundry & Machine Co., Canton, Ohio, becoming secretary in charge of sales and advertising. He has been sales manager of Doelger & Kirsten since March 1, 1923.

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HENRY CLAY GRATON, one of the founders of Graton & Knight Co., Worcester, Mass., celebrated his 99th birthday on July 9.

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FRANK J. PHILLIPS, for many years associated with the Concrete Steel Co., Boston, and recently with the General Fireproofing Co., at Philadelphia, has again associated himself with the Boston concern.

W. R. CUNNICK has been appointed district sales manager at Detroit for the Weirton Steel Co., Weirton, W. Va., succeeding A. J. BOPP, who recently resigned to enter business for himself.

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H. H. RICE, of the General Motors Corporation and treasurer of the National Automobile Chamber of Commerce, and J. WALTER DRAKE, of the Hupp Automobile Co. and former Assistant Secretary of Commerce, have been appointed by President HERBERT HOOVER members of a delegation to represent the United States at the Pan American Highway Congress to be held in Rio de Janeiro in August. Mr. Drake will be chairman of the delegation.

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GEORGE A. V. RUSSELL, formerly manager of the engineering department of the Brightside Foundry & Engineering Co., Ltd., Sheffield, England, now engineer of the metal group companies of the Imperial Chemical Industries, Ltd., Birmingham, has sailed from Quebec on his return trip to England after an extended stay in the United States and Canada.

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E. J. BURNES, who since the first of the year has been assistant general sales agent of the Chateaugay Ore & Iron Co., has been appointed general sales agent of the company, with headquarters at 26 Liberty Street, New York, as successor to Ralph W. Clark, deceased. Mr. Burnes was for five years in the New York office of Pilling & Co. and for a year before his connection with the Chateaugay interests was with the Semet-Solvay Co.

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GEORGE A. PUGH has been elected a vice-president of the Aetna Standard Engineering Co., Youngstown, and will be in charge of machinery sales. H. E. MELIN has been appointed assistant manager of machinery sales. M. D. BAUGHMAN has been made manager of the operating department and will have charge of the plants and production at Ellwood City, Pa., and Warren, Ohio.

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MYRON C. TAYLOR, chairman of the finance committee of the United States Steel Corporation, attended on July 15 in Detroit the launching of an ore steamboat that was named for him. The vessel will be added to the corporation's ore-carrying fleet, operated by the Pittsburgh Steamship Co.

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W. S. PILLING of Pilling & Co., Philadelphia, leaves New York for San Francisco on July 20, with a party of friends to begin a round-the-world tour, expected to extend over nine months to a year. Hawaii, Japan, China, Indo-China, Siam and India, Arabia, Turkey and various European countries are included in the itinerary.

OBITUARY

CHARLES E. SCOFIELD, New York district sales manager of the Wheeling Steel Corporation since 1922 and for 35 years or more identified with distribution of sheet steel in the New York territory, died July 9 of heart failure as he was going to dinner in his summer home at Rowayton, Conn. He was 51 years of age. He started in the sheet business as a boy in the New York office of Merchant & Evans Co., of Philadelphia. He was with the Wheeling Corrugating Co. from 1907 to 1922. For three years he was in

C. E. SCOFIELD

charge of city sales for that company, and during the remainder of the period he was district sales manager. Mr. Scofield was in his office at 120 Broadway, New York, the day of his death. Not feeling well, he went home at noon and after a nap in the afternoon arose for dinner. He was a Mason, a member of the New York Athletic Club and the Shore Haven Country Club, Shore Haven, Conn.

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JOHN S. RUNNELLS, retired chairman of the board of the Pullman Co., died June 18 at Chocorua, N. H. He would have been 85 years old on July 30. He was graduated from Amherst College in 1865 and later was admitted to the bar in Iowa and practiced law at Des Moines, where he remained until 1887. That year he was appointed counsel for the Pullman Co. and later vice-president and general counsel, and from 1911 to 1922 was president of the company.

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E. S. GABRIAULT, erecting engineer with the Nordberg Mfg. Co., Milwaukee, and in their employ for 20 years, died, July 5, at Lima, Peru, where he had gone to supervise the installation of Nordberg power equipment for a large mining company. He left Milwaukee, May 28, on this trip.

P. J. LANDWER, assistant production engineer of the Wright Aeronautical Corporation, Paterson, N. J., died on July 10. He had been associated with the company for one year and previously had been connected with Mack Trucks, Inc.

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WILLIAM F. FAIR, blast furnace superintendent, Youngstown Sheet & Tube Co., Youngstown, died suddenly at his home in that city on July 10. He was 50 years of age and had been employed by the company for 21 years.

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WALTER F. HOOKER, manager of the Boston branch of Graton & Knight Co., Worcester, Mass., died at his home in Melrose, Mass., July 9. He was associated with the Worcester concern 30 years, starting in the workshops and working up to the Boston management. He was born in Lee, Mass., 53 years ago.

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H. O. CARY, at one time superintendent of the DeKalb plants of the American Steel & Wire Co., died June 19 at his home in Bangor, Mich. He was 79 years of age and had been in failing health for over a year.

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FREDERIC H. POOR, head of Frederic H. Poor, Inc., 50 Church Street, New York, manufacturer and distributer of tractor cranes and allied products, died at his home, 112 Park Avenue, Yonkers, N. Y., on July 9, at the age of 47. He had been ill for some time. Mr. Poor was a graduate of Harvard University in the class of 1903 and a year later received an engineer's degree at the same university. He went with the General Electric Co., remaining there five years at Schenectady, N. Y., and then moving to the New York office. In 1910 he became general manager of the S K F Ball Bearing Co., New York, and introduced that company's product in the United States. During the war he was president of the Triplex Safety Glass Corporation, New York. In 1919 he formed the firm of Wesselhoeft & Poor, which exported a wide variety of machinery to Colombia and Venezuela through four branch offices in those countries. This business was sold in 1926 to the International General Electric Co., and Mr. Poor afterward organized his own company.

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WILLIAM YATES, for 45 years an employee of the Heppenstall Forge & Knife Co., Pittsburgh, and most recently superintendent of the plant, died at a Pittsburgh hospital on July 14, aged 77 years.

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OTTO GOSSELL, for a number of years representative in Great Britain for the German steel producers Dortmunder Union and Aachener Hutte, with headquarters in London, died July 13. He was 80 years of age and had been a member of the Iron and Steel Institute (British) since 1880.

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JOSEPH HAMMELE, sales manager and a director of the Bausch & Lomb Optical Co., Rochester, died July 2. He had been associated with the company since 1882.

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GEORGE T. MOLYNEAUX, vice-president of the Price Iron & Steel Co., Chicago, broker in scrap iron and steel, died following a heart attack July 12 at the age of 35 years. He was born at Bristol, Tenn., where funeral services were held. After graduating from Yale University, he was for a number of years assistant professor of languages. At the time of his death he was an associate professor at the University of Ontario. He was well-known in educational circles as a linguist and a historian. He was a member of the Hamilton Club and the Chicago Yacht Club.

Second Quarter Earnings of Steel Companies

Net earnings of the Acme Steel Co. for the first six months of 1929 showed an increase of 16 per cent over the corresponding period of 1928. Net profit for the six months just ended, after all expenses, Federal and local taxes and depreciation, was $1,730,671, being at the rate of $6.31 a share. Net profits for the first six months of 1928 were $1,014,590. This company has recently erected three new buildings, one as an addition to the cold-rolled strip plant, another to house a new hot-rolled continuous strip mill and a third to be used as a warehouse. The two additional mill units will be ready to operate on or about Oct. 1.

A. M. Castle & Co. report record earnings for the second quarter and for the first six months of 1929. For the quarter ended June 30, net profits were $235,991, after all charges, including depreciation and Federal taxes, equal to $1.96 a share earned on 120,000 common shares. This compares with $1.61 a share in the previous quarter and $1.59 a share in the second quarter of last year. Net for the first six months was equal to $3.58 a common share, compared with $2.71 a share earned in the first half of 1928.

A 20 per cent common stock dividend on a basis of one new share for each five held has been voted by the directors of the Youngstown Sheet & Tube Co., Youngstown. They have also voted to increase the no par common stock from 1,000,000 no par shares to 2,000,000 shares. A special meeting of stockholders has been called for Aug. 15 to secure ratification of the directors' action.

European Steel Markets Less Active

British Holidays Ease Conditions—Germany Making Much Steel in Open-Hearth Furnaces—Spain Produces More Steel

(*By Cable*)

LONDON, ENGLAND, July 15.

CLEVELAND furnaces are now offering to accept last quarter pig iron contracts on a basis of £3 12s. 6d. ($17.58) per ton for No. 3 foundry, but buyers show no haste in contracting, as the Scottish holidays have begun and the English holidays will follow shortly. Meanwhile coke and ore prices are stronger and pig iron producers assert that production at present prices is unprofitable.

Hematite iron producers are active sellers, principally for export, and some good contracts for forward delivery have been negotiated.

Finished steel is generally quiet, but most Northeast Coast mills are well occupied with current contracts. Export inquiry is fair, but expansion of Far Eastern business is hindered by the unfavorable exchange rates.

British exports in June were 35,000 tons of pig iron, of which the United States received 1000 tons. Total exports of iron and steel were 307,000 tons.

Tin plate prices are irregular, as some mills are seeking orders, while others are well engaged. Higher tin prices are influencing consumers and inquiry has increased, but business is still only fair.

Galvanized sheets are quiet. Exports in June totaled 43,000 tons, the smallest since the coal strike period in 1926. India took only 8000 tons. Calcutta stocks are still large, so that little improvement in demand is expected for some time. Japan has bought further small lots of both heavy and light-gage black sheets.

Thomas W. Ward, Ltd., Sheffield, has purchased from the Frodingham Iron & Steel Co., Ltd., Scunthorpe, a large part of the properties of the Yorkshire Iron & Coal Co., Ltd., Leeds.

Continental markets are dull, but there is pressure from certain mills to secure orders. Semi-finished steel and merchant bars are especially easy, but shape and plate prices are being maintained.

Belgian works are reported to have secured about 30,000 tons of rails from Belgian railroads, which should aid in steadying the semi-finished market. The International Wire Rod Cartel has decided to maintain export prices, except those for the Far East, which have been modified as a result of reduced freight rates.

French production in May was 897,000 tons of pig iron and 819,000 tons of raw steel. Hanomag has secured an order for 52 locomotive boilers for India.

British Pig Iron Shortage Continues—Steel Active

LONDON, ENGLAND, July 5.—The principal feature of the iron and steel market is the continued increase in strength of pig iron prices. Demand from both domestic and export buyers is large and an even greater volume of business could be done if larger supplies were available. In the Cleveland district, especially, the shortage of iron is acute and consumers have been forced to supplement their supplies by purchases in other districts. The shortage is the result of insufficient coking coal and iron ore, which is preventing the blowing in of more furnaces.

At present there are 44 furnaces in blast in the Cleveland district, but by fall it is expected the total will have increased to 50. Producers of foundry, forge and basic iron are fully sold until October, and have not yet opened their books for last quarter tonnage. As a result, merchants with pig iron in stock are obtaining high prices for prompt shipment. Hematite iron is also stronger as a result of substantial buying by both domestic and foreign users.

Finished iron and steel production is steady, but curtailment is expected shortly with the arrival of the Glasgow annual holiday period. A number of plants in that district will suspend operation for only 10 days, while others will close for a full fortnight. New business has not been especially large, but specifications against contracts have been heavy, particularly for shipyard material. Export trade is still only moderately active.

British and Continental European Export prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3	12½s.	to	£3	13½s.	$17.58	to	$17.82
East Coast Hematite	3	14½	to	3	15	18.06	to	18.18
Ferromanganese, export	14	0				67.90		
Billets, open hearth	6	7½	to	6	10	30.92	to	31.52
Sheet bars, open hearth	6	5	to	6	10	30.31	to	31.52
Black sheets Japanese specifications	13	5				64.26		
Tin plate, per base box	0	18⅛	to	0	18½	4.40	to	4.48
Rails, 60-lb. and heavier	7	15	to	8	15	37.59	to	42.43
						Cents per Lb.		
Steel bars, open hearth	7	15	to	8	10	1.67	to	1.84
Beams, open hearth	7	2½	to	7	12½	1.55	to	1.65
Channels, open hearth	7	7½	to	7	17½	1.60	to	1.71
Angles, open hearth	8	2½	to	8	12½	1.76	to	1.86
Ship plates, open hearth	7	12½	to	8	2½	1.66	to	1.76
Black sheets, No. 24 gage	10	5	to	10	10	2.21	to	2.27
Galvanized sheets, No. 24 gage	13	7½	to	13	10	2.90	to	2.92

Continental Prices f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3	10s.	to	£3	14½s.	$16.97	to	$18.06
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3	12				17.45		
Billets, Thomas	5	2	to	5	5½	24.73	to	25.58
Sheet bars, Thomas	5	5	to	5	5½	25.46	to	25.58
Wire rods low C., No. 5 B.W.G.	6	5	to	6	6¼	30.31	to	30.61
Black sheets, No. 31 gage, Japanese	12	10				60.62		
Rails, 60 lb. and heavier	6	10*				31.52		
Rails, light	6	1½				29.46		
						Cents per Lb.		
Steel bars, merchant	5	15	to	5	16	1.27	to	1.28
Steel bars, deformed	5	15	to	5	16	1.27	to	1.28
Beams, Thomas, British standard	5	3	to	5	8	1.12	to	1.13
Channels, Thomas, American sections	6	0				1.32		
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	5	6				1.14		
Angles, Thomas, 3-in.	5	17				1.29		
Ship plates, open-hearth inspected	7	10				1.62		
Hoop and strip steel, over 6-in. base	5	17				1.29		
Wire, plain, No. 8 gage	7	10				1.62		
Wire, galvanized, No. 8 gage	9	10	to	9	12½	2.06	to	2.12
Wire, barbed, 4-pt. No. 12 B.W.G.	12	0½				2.60		
Wire nails, base	8	0½				$1.74	per keg	
Wire nails, assortments, 1 to 6-in., keg	10	9				2.26		

*Open-hearth steel, 10s. ($2.42) per ton extra.

Germany Large Exporter of Open-Hearth Rods

HAMBURG, GERMANY, June 24.—German mills have become a dominant factor in the export of open-hearth wire rods and rivet stock. While there is no actual agreement in the Wire Rod Cartel, allocating open-hearth steel orders to Germany, both Belgian and French producers have gradually retired from this field and in most cases do not quote on such inquiries. German mills, in turn, are not offering much competition for Thomas steel business in wire and rivet rods.

The nominal quotation on open-hearth rods, No. 5 B.W.G., is £6 12s. 6d ($32.13) per ton, but almost no orders have been closed at less than £6 15s. ($32.73) per ton, and as most business in open-hearth steel is limited to orders for 50 to 250 tons, the price is about £6 17s. 6d. ($33.34) per ton.

Rivet manufacturers in Holland and Scandinavian countries, which import their supplies of open-hearth rods, have been unable to obtain lower prices from either Belgium or France on the sizes most used, 3/16-in., ¼-in. and 5/16-in. Rods for the drawing of fine music wire and wire rope are almost exclusively supplied by Germany.

Output of Open-Hearth Rails Increasing

HAMBURG, GERMANY, July 1.—Although the German Railroad Corporation recently informed the steel industry that there would be no restriction placed on the continued use of Thomas steel rails, output of this grade is constantly declining. Prior to 1913 the ratio of Thomas steel rails to open-hearth was 78 to 22, in 1924 the ratio had declined to 67 to 33 and by the end of last year it was 48 to 52. At present it is estimated that of every 100 tons of rails rolled in Germany, 55 tons are open-hearth and 45 tons Thomas steel. This increase of open-hearth rail production is expected to continue.

Steel Merchants to Restrict German Export Activity

HAMBURG, GERMANY, July 1.—The meeting here on June 28 of the Federation of German Industries and the Federation of German Exporters discussed at considerable length the relationship of the German steel and hardware industry and the exporters. Although no general agreement was established between the two associations, it appears certain that in the future the German hardware industry will, to a great extent, withdraw from direct export business, into which it entered following the war. The greater part of the heavy steel exports, however, will continue to be made through the selling organizations of the steel industry. This is expected to lead to an improvement in the profits of export trade in hardware and small steel products, which have been seriously restricted in the past because of keen competition between the hardware and steel merchants and the exporters.

*Exports of American Portable Pneumatic Metal-Working Tools**

Country of Destination	1928	1927
United Kingdom	$464,888	$505,073
Japan	257,801	121,735
Canada	168,290	165,140
France	166,804	131,885
Brazil	97,344	37,282
Spain	70,278	61,982
Australia	64,824	94,541
British India	53,893	66,582
Italy	44,206	49,170
Germany	38,832	34,526
Mexico	31,670	14,336
Argentina	31,590	21,342
South Africa	30,894	50,946
Total, including other countries	$1,704,146	$1,575,358

*Report made by L. J. Cochrane, Industrial Machinery Division, Department of Commerce.

Spanish Steel Output Increased in 1928

MADRID, SPAIN, July 20.—Production of steel in Spain was about 8 per cent more in 1928 than in 1927 and a further increase is expected for 1929. Total output of pig iron was 565,000 metric tons, of steel ingots 733,650 tons and of finished products 692,887 tons. A total of 4129 tons of ferromanganese and 149 tons of ferrosilicon was produced in 1928.

Germany Second in Steel Consumption

HAMBURG, GERMANY, June 24.—Efforts of the German steel industry through the publicity department of the Stahlwerks-Verband A. G. to extend the use of steel in Germany are meeting with success. In the per capita consumption of steel, Germany ranked fourth in 1926, with the United States first, Great Britain second and Sweden third. Last year Germany ranked second with 546 lb. per capita, compared with 526 lb. per capita in Great Britain and 438 lb. per capita in Sweden. France was fifth with 392 lb. per capita, Belgium sixth with 381 lb., Holland seventh with 356 lb., Switzerland eighth with 312 lb., Czechoslovakia ninth with 224 lb., and Denmark tenth with 222 lb. The lowest European consumption of steel was in Russia, with only 53 lb. per capita.

*Principal Foreign Markets for American Air Compressors**

Country of Destination	1928	1927
Canada	$941,631	$899,335
Spain	572,542	383,113
United Kingdom	443,526	488,566
Japan	420,373	348,511
Brazil	404,169	296,345
France	401,945	299,795
Russia	380,205	285,480
Belgium	289,776	134,564
Argentina	278,412	263,990
British India	267,638	170,891
Colombia	245,773	174,424
Mexico	232,890	247,276
Italy	221,398	191,457
Australia	195,244	317,109
Germany	168,502	157,523
Venezuela	157,642	57,417
Peru	100,033	87,209
Netherlands East Indies	83,464	47,021
Union South Africa	66,986	110,166
Cuba	60,350	122,233
Algeria and Tunisia	43,900	33,111
Total, including other countries	$6,737,534	$5,872,682

*From United States Department of Commerce.

Establishes Wire Publicity Bureau

HAMBURG, GERMANY, July 1.—German steel advertising through the Stahlberat Ungestelle at Düsseldorf is to be extended by the establishment of a second organization, the Drahtberatungsstelle, which will issue publicity and extend information on wire and its uses. Advertising of the new bureau advocates the wider use of wire and consumers will be freely advised on the kinds and qualities of wire they may require. Wire netting is now being widely used in Germany for road construction and the efforts of the new bureau will be directed to increasing this use both in Germany and in foreign markets.

New Company to Operate Famous Sheffield Works

LONDON, ENGLAND, July 2.—Andrews, Toledo, Ltd., has been formed to acquire the plant and assets, as of Nov. 3, 1928, of the old-established mill of Jno. Hy. Andrew & Co., Ltd., Sheffield. The new company has capital stock of £300,000 ($1,455,000), and the board of directors includes J. F. Parker, chairman, G. St. J. Strutt and Engineer Vice-Admiral Sir George Goodwin.

The plant, which manufactures all kinds of high-grade tool steels for the automobile and aircraft industries and wire rods, is to be modernized throughout.

Records Observations of Transcontinental Trip

S. A. Gabel, president Summerill Tubing Co., Bridgeport, Pa., was a member of the special party which made the inaugural trip of the Transcontinental Air Transport, Inc., just previous to the opening of the combination air and rail passenger route operated jointly by T. A. T. and the Pennsylvania Railroad. On the journey Mr. Gabel kept a log in which he recorded his observations. At Wichita, Kan., where the plane landed for a short time, he found that airplane manufacturers in that district are rushed with orders. When the trimotored plane was in New Mexico, he noted that the motors were using about 60 gal. of gasoline an hour and were making about 1600 r.p.m.

Machinery Markets and News of the Works

Machine Tool Sales Decline

Current Bookings, However, Are 20 Per Cent Better Than in Same Period Last Year

REPORTS from machine tool centers reveal that bookings this month have fallen below those of June. However, the New York district has been an exception, with sales equaling or slightly exceeding last month's volume.

Despite the seasonal recession in buying, it is estimated that current business shows a gain of approximately 20 per cent compared with the same period in 1928. The general run of orders has been for replacement purposes and has come from most consuming lines.

A Connecticut machine tool builder has closed for $200,000 worth of equipment, and the Packard Motor Car Co. has bought a few tools for the manufacture of Diesel engines and is expected to purchase a number of additional machines. The General Electric Co. is inquiring for about 30 tools for its electric refrigerator division at Schenectady, N. Y.

Machine tool deliveries are improving slightly, but still range in most cases from six weeks to three months or longer. An important lathe manufacturer cannot make deliveries sooner than the first quarter of 1930.

"June reflected the seasonal tendency toward a slackening in the volume of orders and the falling off has been sufficient to accelerate slightly the downturn of the three months' average index which was indicated in May for the first time since the summer of 1928," states the National Machine Tool Builders Association. "Even so, the rate of recession is not alarming, and so far as can be interpreted at the present time, it cannot be looked upon as a signal that the period of good demand that the industry has been enjoying for the past 12 months is over. The ratio of unfilled orders to shipments shows that the industry still has as good backlog of unfilled orders to work off during the summer months, even though shipments have been stepped up since February to a rate approximately 25 per cent above the rate of shipments last fall."

The association's index of gross orders stood at 291.6 for June, as against 334.3 for May. Shipments totaled 295.5, compared with 300.8 in May, the decline in shipments having been responsible for a slight upturn in the index of unfilled orders, which was 721.8 for June, compared with 721 for May.

New York

NEW YORK, July 16.—Machine tool buying in the first half of July was sustained at a high level, comparable with that in the corresponding period of June. In fact, some dealers declare that sales have been larger than those of last month. The substantial volume of business booked in the past two weeks, together with heavy pending inquiries before the trade, indicates that the usual summer let-down is not likely to materialize this year, and both dealers and manufacturers expect buying to be maintained at a satisfactory rate during the remainder of July and in August.

Several companies state that orders are running approximately 25 per cent ahead of those in the early part of the summer of 1928, despite the fact that deliveries now range from one to three months or longer on numerous tools. The general run of business is for replacement purposes and is distributed among most consuming lines. In some cases companies are in the market for the first time since 1920. The General Electric Co. is inquiring for about 30 tools for its electric refrigerator manufacturing division at Schenectady. Otherwise, purchases and inquiries are for from one to three machines each.

Officials of Fairchild Aviation Corporation, 270 West Thirty-eighth Street, New York, have organized Fairchild Aircraft, Ltd., with capital of $2,000,000 as Canadian subsidiary. Tract of about 265 acres has been acquired at Longueuil, near Montreal, as site for new plant, to include parts and assembling departments, to cost over $100,000 with equipment. Company will establish airport at same location, with hangars, repair shops and other units. Sherman H. Fairchild, head of parent company, will be president of subsidiary; Julian C. Smith is vice-president.

Kent Garage Investing Corporation, 350 Madison Avenue, New York, has awarded general contract to Fred T. Ley & Co., Inc., 578 Madison Avenue, for twenty-five-story automobile service, repair and garage building at Columbus Avenue and Sixty-first Street, to cost about $2,000,000 with equipment. Jardin, Hill & Murdock, 347 Madison Avenue, are architects.

Long Island State Park Commission, Babylon, L. I., will receive bids until July 26, for one 150-ft. steel standpipe, 300,000 gal. capacity, with skeleton steel frame support 175 ft. high. A. E. Howland is chief engineer.

Nichols Copper Co., 25 Broad Street, New York, is having plans drawn for three-story addition, 75 x 80 ft., to plant at Laurel Hill, Flushing, L. I., to cost over $75,000 with equipment. Leddy & Moore, 70 West Fortieth Street, New York, are architects.

Deppe-Merten Corporation, Long Island City, manufacturer of ventilating equipment, skylights, etc., has leased factory at 565 Boulevard for new plant.

Prudent Ice & Coal Co., Brooklyn, care of C. P. Cannella, 1162 Herkimer Street, architect, has asked bids on general contract for a one-story ice-manufacturing plant, to cost more than $100,000 with machinery.

Officials of International Projector Corporation, 90 Gold Street, New York, manufacturer of motion picture machines and parts, have organized General Theatres Equipment, Inc., to take over and expand that company together with a group of interests in kindred field, all specializing in production of projection lamps and other electric lighting equipment and devices. New organization will have combined assets of $67,000,000, and will arrange for early sale of block of stock, part of fund to be used for expansion of different units.

New York Steam Corporation, 280 Madison Avenue, New York, has awarded general contract to George A. Fuller Co., 949 Broadway, for three-story addition to power plant on Water Street 105 x 175 ft., and improvements in present station, to cost $250,000 with equipment.

Richardson Co., 2136 West Boulevard, Cleveland, manufacturer of battery boxes and equipment, is arranging for occupancy in August of plant of American Incubator Co., New Brunswick, N. J., recently acquired, and will carry out an expansion pogram to cost over $100,000. Initial works will total about 60,000 sq. ft. floor space. Cleveland works will be transferred to new site.

Metalkloth Co., Inc., Garibaldi Avenue, Lodi, N. J., manufacturer of filter cloth

products, has asked bids on general contract for one-story addition, to cost about $45,000 with equipment. Liebau & Breiby, 238 Main Street, Hackensack, N. J., are architects.

Allied Motor Industries, Inc., operating Great Lakes Aircraft Corporation, Cleveland, which recently took over plant in that city of Glenn L. Martin Co., has purchased controlling interest in American Cirrus Engines, Inc., 740 Washington Avenue, Belleville, N. J., manufacturer of aircraft motors under British patents, and will operate as unit. It is proposed to expand production of Cirrus engines and it is understood that plant may be removed to another location.

Delaware, Lackawanna & Western Coal Co., 120 Broadway, New York, has filed plans for new coal pockets and distributing plant at Jersey City, N. J., with conveying, loading and other equipment to cost $250,000.

Board of City Commissioners, 710 Bangs Avenue, Asbury Park, N. J., has awarded a general contract to DeRiso Brothers, Inc., 551 Fifth Avenue, New York, for a two-story power plant, for central heating service, to cost $397,000 with equipment. Warren & Wetmore, 16 East Forty-seventh Street, New York, are architects.

G. F. Machine Mfg. Corporation, 130 Bleecker Street, New York, recently organized to manufacture an iron lifter for ironing operations, is in market for gray iron castings, electric switches, wire, etc. Solomon Golub is president.

William H. Nicholls Co., Richmond Hill, N. Y., manufacturer of foundry equipment, has established two new offices, one at 341 West Sixteenth Street, Chicago Heights, Ill., in charge of S. H. Sutton, and another at 2842 West Grand Boulevard, Detroit, in charge of H. L. Ritz.

Michigan Seamless Tube Co., South Lyon, Mich., manufacturer of cold drawn seamless tubing, has appointed H. L. Wanderman, 1440 Broadway, New York, Eastern sales representative.

Herbert Kennedy Co., agent for Societe Anonyme des Hauts Fourneaux et Fonderies de Pont-a-Mousson, of Pont-a-Mousson, France, producer of cast iron bell and spigot pipe, has removed from 475 Fifth Avenue, New York, to Chanin Building, 122 East Forty-second Street. Offices of Intercontinental Pipe & Mining Co., which is building a plant at Chelsea, Mass., have also been moved to new address.

New England

BOSTON, July 15.—The closing on about $200,000 worth of tools by a Connecticut machine tool builder was the outstanding feature of the week. Another Connecticut tool builder has closed on a number of high-priced tools, and several other metal-working plants have placed orders for machines, deliveries extending into the last quarter of 1929. Local machine tool dealers did a fair business the past week, and received a sizable number of inquiries for one or more machines. Surface and internal grinders and lathes, ranging from bench type up to better than 36-in., are in demand in this territory. The city of Boston bought a shaper for a trade school and today closed bids on shapers, tool-room lathes and other equipment for the Mechanics Arts High School. About a dozen single-spindle drills were sold to eight plants.

The Crane Market

WITH both sales and inquiries light, quietness prevails in the crane market. Little important buying has been done this month, and companies which are considering the placing of orders are hesitant about closing. The dullness in the New York district reflects the usual seasonal decline, but this has been somewhat offset by a good volume of business reported from the Middle West. Crane builders continue very busy with no signs of a let-down in plant operations during the summer. A portion of the week's sales are listed below:

Pittsburgh Tube Co., Monaca, Pa., has bought one 5-ton, 100-ft. span electric overhead crane from Northern Engineering Works.

Cincinnati, New Orleans & Texas Pacific has purchased a maintenance-of-way crane from Orton Crane & Shovel Co.

George B. Limbert Co., East Chicago, Ind., has bought one 10-ton, 56-ft. span overhead electric crane from an unnamed bidder.

To speed up deliveries, some New England machine tool builders have temporarily discontinued production of certain types of equipment and are concentrating on the most active lines. The best delivery one Hartford tool builder can make on lathes is first quarter of 1930. Deliveries by New England grinding machine builders are gradually becoming more extended.

Used tool dealers are handicapped by a lack of machines. Business the past week was largely confined to foot presses, hack saws and other small tools.

Buying of small tools is more active and indications are that July sales may reach record proportions.

James Hunter Machine Co., 2 Main Street, North Adams, Mass., has awarded a contract for a machine shop addition.

Bullock Mfg. Associates, 46 Harrison Avenue, Springfield, Mass., manufacturers of tools, contemplate erection of a factory at West Springfield, to cost $30,000.

Liner-Atwill Co., 60 Bartholomew Avenue, Hartford, Conn., sheet metal, will close bids July 18 on one and two-story shop, 50 x 100 ft.

Columbia Airlines, Inc., Springfield, Mass., plans to start production of planes and motors about Sept. 1 at East Springfield. Outboard motors and motorcycles will be chief products. Charles A. Levine is president.

Marlboro Wire Goods Co., Marlboro, Mass., has started work on a plant addition.

Leonard Rooke Co., 486 Broad Street, Providence, manufacturer of valves, has awarded contract for a three-story addition, 60 x 100 ft.

Plantsville Foundry, Southington, Conn., capitalized for $50,000, has incorporated to do a general foundry and machine shop business. T. W. Thompson, Plantsville, Conn., is president.

Plans have been approved by Yale & Towne Mfg. Co., Canal and Market Streets, Stamford, Conn., for a one-story foundry addition, to cost $60,000 with equipment.

Warren Telechron Co., Ashland, Mass., manufacturer of bells, clocks and other electrical products, a subsidiary of General Electric Co., has plans for a two-story addition, to cost about $50,000 with equipment. Fay, Spofford & Thorndike, 44 School Street, Boston, are engineers.

American Brass Co., Waterbury, Conn., a subsidiary of Anaconda Copper Mining Co., 25 Broadway, New York, has purchased Randolph-Clowes Co., of same city, producer of kindred brass and copper specialties, and will consolidate.

Edison Electric Illuminating Co., 39 Boylston Street, Boston, has filed plans for a multi-story equipment storage and distributing plant, with repair facilities, to cost $120,000 with equipment.

Shell Eastern Petroleum Products Co., operated by Shell Union Oil Corporation, 65 Broadway, New York, has plans for a new storage and distributing plant at East Hartford, Conn., to cost about $100,000 with equipment.

Manning Mfg. Co., Rutland, Vt., manufacturer of creamery and dairy machinery, parts, etc., has awarded general contract to Mozzicato & Dipietro, 12 Hancock Street, Medford, Mass., for one-story and basement branch plant at Somerville, Mass., to cost about $45,000 with equipment.

Stamford Water Co., Summer Street, Stamford, Conn., has awarded general contract to Vuono Construction Co., 303 Main Street, for two-story mechanical shop, 55 x 90 ft., to cost about $35,000 with equipment.

Philadelphia

PHILADELPHIA, July 15.—Plans have been completed by I. Fischman & Sons, Tenth Street and Allegheny Avenue, Philadelphia, manufacturers of soda fountains and accessories, for one and two-story plant, to cost $1,500,000 with machinery. Clarence E. Wunder, 1520 Locust Street, is architect.

Proctor & Schwartz Electric Co., subsidiary of Proctor & Schwartz, Inc., Seventh Street and Tabor Road, manufacturer of drying machinery, air-conditioning equipment, etc., has awarded general contract to Wark Co., 1600 Walnut Street, for two-story plant on adjoining site, to cost $250,000 with equipment. Simon & Simon, Fidelity-Philadelphia Trust Building, are architects.

Philadelphia Steam Co., Forty-ninth Street and Grays Ferry Avenue, Philadelphia, recently formed by Edward H. Reuss, Jr., and associates, has applied for permission to take over under lease steam power plant of Pennsylvania Railroad Co., now in course of construction at Race and Thirtieth Streets, and to enlarge station about four times present size for central heating service to be furnished by company in area bounded by Broad, South and Fortieth Streets and Girard Avenue, for which franchise has been secured. Company will install pipe lines and system in district noted to cost $5,600,000, and is scheduling completion in November. Later, conduit system will be extended at cost of more than $10,000,000 additional. Mr. Reuss is president.

Daison Mfg. Co., Inc., 462 North Eighth Street, Philadelphia, manufacturer of lighting equipment, lamp shades, etc., has purchased four-story factory on site, 60 x 225 ft., at 2021-29 Naudain Street, for new plant. Increased output will be developed.

Hess-Bright Mfg. Co., Front Street and Erie Avenue, Philadelphia, manufacturer of ball bearings, has awarded general contract to F. V. Warren Co, 1913 Arch Street, for two additions, two stories, 60 x 122 ft., and one story, 60 x 140 ft., to cost about $100,000 with equipment.

Edward Board, Inc., 1641 North Twelfth Street, Philadelphia, has been organized

with capital of $30,000 to take over and expand plant and business at same address, heretofore operated under name of Edward Board, machinist. New company will design and manufacture special and standard machinery and parts. Mr. Board is president and treasurer.

Atlantic City Electric Co., Atlantic City, N. J., is planning construction of steel tower transmission line from new generating plant at Deep Water Point to Woodstown and Pleasantville, 57 miles, to cost more than $500,000.

Board of Education, Bridgeton, N. J., plans installation of manual training equipment in two-story junior high school to cost $425,000, for which bids will be asked on general contract in about 60 days. Edwards & Green, 548 Federal Street, Camden, N. J., are architects.

Hazle Brook Coal Co., Mount Carmel, Pa., has authorized immediate construction of electrically operated coal breaker at colliery near Mount Carmel, to cost about $1,000,000 with machinery.

Wire Fabrics Corporation, Mount Wolf, Pa., manufacturer of wire cloth and other wire goods, has awarded general contract to L. M. Klunk, 205 South George Street, York, Pa., for two-story addition, to cost about $40,000 with equipment.

Transmission Engineering Co., Provident Trust Building, Philadelphia, has been organized by L. H. Shingle and associates to specialize in power transmission problems. Mr. Shingle is treasurer of Power Transmission Association.

Specialty Metal Products Co., Inc., 539 Diamond Street, Philadelphia, is engaged in manufacture of sheet metal stampings and will also do machine work on contract.

South Atlantic

BALTIMORE, July 15.—Plans are under way by Levering Brothers, Inc., 200 Key Highway, Baltimore, manufacturer of sash weights and other iron castings, for one and two-story branch foundry at Hanover, Pa., to cost over $80,000 with equipment.

Maryland Airport Corporation, Cumberland, Md., recently formed with capital of $100,000 by John G. Wiebel, La Vale Street, and associates, will establish an airport at Pinto Road and McMullen Highway, where property has been secured. Project will include hangars, repair shops, oil storage and other buildings, to cost more than $65,000 with equipment. Mr. Wiebel will be secretary and treasurer.

American Radiator & Standard Sanitary Corporation, 40 West Fortieth Street, New York, is concluding negotiations for purchase of Campbell Metal Window Corporation, Baltimore, manufacturer of steel and metal windows and sash for office buildings, etc. It is proposed to increase output at Campbell plant, particularly in specially designed metal window with sill to accommodate new type of radiator to be hung directly from sill.

Sylvania Industrial Corporation, Fredericksburg, Va., recently organized with capital of $3,500,000, has acquired local property for new plant to manufacture industrial chemicals and kindred products, to cost over $250,000 with equipment.

Richfield Oil Corporation, Whitehall Building, New York, subsidiary of Richfield Oil Co., of California, Inc., Los Angeles, has acquired 40-acres in Curtis Bay district, Baltimore, and plans construction of new storage and distributing plant, with power house, pumping station and other units, to cost more than $150,000 with equipment. John B. Stein, Woolworth Building, New York, is engineer.

Board of District Commissioners, District Building, Washington, will soon take bids for one-story mechanical and repair shop at Bryant Street pumping station, to cost $50,000 with equipment. A. L. Harris, address noted, is municipal architect. Bids will also be asked about same time for one and two-story automobile service, repair and garage building for highway department on adjoining site, to cost about $170,000 with equipment.

City Council, High Point, N. C., is said to be planning construction of a municipal electric light and power plant, to cost about $50,000 with equipment.

Atlanta Gas Light Co., Atlanta, Ga., has awarded general contract to United Construction Co., Inc., Georgia Savings Bank Building, for one-story equipment storage and distributing plant, with repair department, 115 x 300 ft., to cost about $100,000 with equipment; also for one-story automobile service, repair and garage building, 60 x 120 ft., at same location for company motor trucks and cars. George Kollock is company engineer.

Champion Fibre Co., Canton, N. C., is reported considering construction of a new paper mill at Tuscaloosa, Ala., and has taken options on site. Project will cost over $200,000 including machinery.

Palmer & Lambdin, 513 North Charles Street, Baltimore, architects, are asking bids on general contract for five-story automobile service, repair and garage building, 60 x 185 ft., to cost more than $175,000 with equipment.

Board of Trustees, Western Carolina Teachers' College, Cullowhee, N. C., has engaged Charles E. Waddell, Jackson Building, Asheville, N. C., engineer, to prepare plans for a hydroelectric power plant on Tuckaseegee River, to cost more than $100,000 with equipment.

Buffalo

BUFFALO, July 15.—Work is under way by Sun Oil Co., Philadelphia, and 2246 Niagara Street, Buffalo, on storage and distributing plant near Kenmore, Tonawanda Township, to cost $240,000. Project will include automobile service and garage building for company motor trucks.

New York State Electric Corporation, 123 Cayuga Street, Ithaca, N. Y., is reported planning new steam-operated electric power plant at Carmel, N. Y., to cost more than $85,000.

Marcellus Casket Co., Van Rensselaer Street, Syracuse, N. Y., has plans for four-story addition, to cost more than $90,000 with equipment. M. L. King, Dennison Building, is architect.

Buffalo Foundry & Machine Co., 1543 Fillmore Avenue, Buffalo, will build a one-story addition, to cost about $25,000 with equipment.

Schroon River Pulp & Paper Co., Warrensburg, N. Y., will carry out an expansion program, including installation of new machinery in pulp wood and other departments and modernizing of present equipment, to cost over $40,000. Walter Carr is in charge.

National Magnetic Clock Corporation, Buffalo, recently organized by Edwin S. Burrows, 136 Lancaster Avenue, and associates, with capital of $25,000, plans operation of local factory to manufacture special magnetic clocks and clock mechanisms.

Aero Corporation of America, Inc., organized under Delaware laws, will take over and consolidate Covert Gear & Mfg. Co., Lockport, N. Y., and Simplex Aircraft Corporation, Defiance, Ohio. Expansion is planned. E. J. Allen and Alwin A. Gloetzner, presidents of Simplex and Covert companies, respectively, are identified with new organization.

Breuil & Bennett Fuel Oil Co., Ellicott Square, Buffalo, is planning new storage and distributing plant near Kenmore, to cost about $100,000 with equipment.

Pittsburgh

PITTSBURGH, July 15.—Following a few days of comparative quiet, occasioned by the Fourth of July holiday, the machinery trade has resumed the activity which prevailed during June and this month promises to be considerably above the average for this time of year. A number of tools have been placed and a favorable factor is fresh inquiries of sizable volume. One new list includes 10 tools and another six, while several call for single items. The Westinghouse Electric & Mfg. Co., has not yet begun to close against its third quarter list, but requirements indicate that heavy purchases against this list will continue throughout the quarter.

It is expected that the list for the new A. M. Byers Co. plant at Ambridge, Pa., will be out in about a month and the requirements of the Bethlehem Steel Co. for expansion at Johnstown will probably be announced at about the same time.

Although July and August are usually rather quiet months in the machinery business because of the vacation periods of executives, it is thought that the placing of tools will see little interruption this year.

Blair Strip Steel Co., New Castle, Pa., will build a one-story addition, 115 x 125 ft., to cost about $100,000 with equipment.

Pittsburgh Tube Co., Vandergrift Building, Pittsburgh, has plans for two additions, each one story, 60 x 420 ft. and 105 x 240 ft., to double present capacity. Installation will include two or more traveling cranes. Project is reported to cost more than $175,000 with equipment. C. O. Spillman is general superintendent.

Standard Steel Propeller Corporation, Homestead, Pa., has work under way on expansion at local mill to increase output from three to four times present rating of 350 propellers per month. Work will cost more than $100,000.

Lone Star Gas Corporation, Farmers' Bank Building, Pittsburgh, operating natural gas properties in Texas and other Southern States, has arranged for increase in capital from 2,000,000 to 7,000,000 shares of stock, no par value, part of fund to be used for expansion.

Lawrence Motor Co., Mercer Street, New Castle, Pa., has awarded general contract to Hoyland & Frasso, 411 Leasure Street, for four-story service, repair and garage building, to cost $140,000 with equipment. W. C. Eckles Co., Lawrence Savings & Loan Building, is architect.

West Virginia Coal & Coke Corporation, Huntington, W. Va., has been organized with capital of $2,400,000, to take over and expand West Virginia Coal & Coke Co., with properties in Elkins, Bower and Logan Counties, in receivership. New organization is arranging for bond issue of $2,000,000 and sale of 48,000 shares of stock, of which about $1,000,000 will be used for extensions and improve-

ments in mines, including installation of electrically-operated machinery, remodeling and improving of tipples, plants for coal sorting and preparation, conveying and hauling facilities, etc. John C. Cosgrove, one of receivers for former company, will be president of new corporation; A. H. Crane will continue as secretary and treasurer.

Kittanning Limestone Co., Kittanning, Pa., has changed name to Kittanning Cement & Limestone Co., and plans expansion, including construction of cement mill, building of dock 2500 ft. long, extensions in conveying, distributing and storage facilities, etc., to cost more than $600,000.

Detroit

DETROIT, July 15.—Contract has been let by Culver-Stearns Mfg. Co., 3513 Woodward Avenue, Detroit, manufacturer of automobile parts, lighting equipment, etc., to Beyster & Olmstead, General Motors Building, for two-story plant unit, to cost about $50,000 with equipment. J. Ivan Dise, McKerchey Building, is architect.

Board of Trustees, Detroit House of Correction, Detroit, is having plans drawn for power house for new group of buildings at Plymouth, Mich., entire project to cost more than $200,000. Albert Kahn, Inc., Marquette Building, is architect and engineer.

Excell-O Aircraft & Tool Corporation, 1469 East Grand Boulevard, Detroit, recently organized to take over and operate Excell-O Tool & Mfg. Co., same address, has plans under way for expansion, primarily to increase facilities for manufacture of aircraft parts and specialties. Company has arranged for stock issue to total $940,000, considerable part of fund to be used for purpose noted.

Kunkel Mfg. Co., Hart, Mich., manufacturer of automobile heaters, valve grinding tools, etc., is erecting one-story addition, to cost about $40,000 with equipment.

Streng-Chevrolet Co., 8510 Twelfth Street, Detroit, A. B. Streng, president, representative for Chevrolet automobile, has awarded general contract to Downey & Davis, Fisher Building, for three and four-story service, repair and garage building, to cost about $150,000, with equipment. Andrew Morrison, 2231 Park Avenue, is architect.

Crosby-Ross Window Equipment Corporation, Ann Arbor, Mich., recently organized with capital of $100,000 has taken over plants and properties of Crosby Mfg. Co., Ypsilanti, Mich., manufacturer of screens, window sash, etc., and Frederickson-Williamsen Co., Detroit, manufacturer of invertible window hardware, and will consolidate. Former plant at Ann Arbor of Orange Crush Co. has been purchased and will be remodeled to manufacture invertible window hardware, screens, storm sash, etc. I. E. D. Ross, Detroit, is president, and William M. Laird, Ann Arbor, treasurer.

Detroit Aircraft Corporation, Detroit, has arranged for purchase of controlling interest in Lockheed Aircraft Corporation, Los Angeles, and will be active in management. It is proposed to carry out an expansion program at last noted plant, to cost over $75,000 with equipment.

Schermack Corporation, 1164 West Baltimore Avenue, Detroit, manufacturer of vending machines and parts, is planning new units to cost over $250,000 with equipment. Albert Wood, 2111 Woodward Avenue, is architect.

Sherrill Ambler, Northville, Mich., has purchased local plant and property of American Bell & Foundry Co., consisting of about 4½ acres improved with one-story buildings totaling about an acre of floor space. New owner will continue production as heretofore, and plans development of Bell furnace division of business with increase in foundry output.

Chicago

CHICAGO, July 15.—Reports of activity in the local machine tool market vary, some dealers finding July sales equal to those in June, while others report sales less than in the previous month. New purchases in the last week were in moderate volume and from widely scattered sources. Large buyers, though having in mind needs for the future, are slow in making their wants known.

Progress is being made on lists for several farm machinery manufacturers, but there is a growing impression that definite action will not be taken until early fall. Dealers' unfilled orders are large and deliveries are improving slowly. Complaint is frequently heard that railroad cars, suitable for loading some types of machinery, are at times difficult to obtain. The used tool market remains active.

Chicago Screw Co., 1026 South Homan Avenue, Chicago, will build a four-story addition to machine shop, 70 x 124 ft. J. B. Fisher, 140 South Dearborn Street, is architect.

Comandor Furnace Co., Vandalia, Ill., is erecting a new building, 56 x 240 ft., which will provide about 14,000 sq. ft. of additional manufacturing space.

Contract has been let by W. H. Salisbury Co., 401-21 Morgan Street, Chicago, manufacturer of rubber products, to Rune & Son, 6753 Stony Island Avenue, for one and two-story additions, 116 x 125 ft., to cost about $120,000 with equipment. Albert P. Dippold, 3948 Cottage Grove Avenue, is architect.

B. Mercil & Sons Plating Co., 1921 Fulton Street, Chicago, has awarded general contract to Chicago Industrial Construction Co., 53 West Jackson Boulevard, for one-story addition, 100 x 121 ft. A 30-ft. span traveling crane will be installed. Expansion will cost more than $70,000 with equipment.

Minnesota Mining & Mfg. Co., Forest and Fauquier Streets, St. Paul, Minn., manufacturer of abrasive materials, mining specialties, etc., is asking bids on general contract for a two-story and basement addition, to cost about $150,000 with equipment. Toltz, King & Day, Inc., Builders' Exchange Building, is architect and engineer.

American Beet Sugar Co., Steel Building, Denver, has plans for a one-story addition to mill at Rocky Ford, Colo., 40 x 145 ft., to cost about $85,000 with equipment.

Rath Packing Co., Elm and Sycamore Streets, Waterloo, Iowa, meat packer, has plans for six-story addition, to cost about $250,000 with conveying, refrigerating and other equipment. Henschien & McLaren, 1637 Prairie Avenue, Chicago, are architects and engineers.

Burst-Harig Mfg. Co., 1735 Carroll Avenue, Chicago, recently organized to manufacture tools, dies, etc., is completing a one-story machine shop, to cost about $30,000 with equipment.

R. H. Buhrke Co., 4540 Fullerton Avenue, Chicago, manufacturer of golf sticks, irons, etc., has awarded general contract to C. S. Miller, 5338 North Spaulding Avenue, for two-story plant, 100 x 125 ft., to cost about $65,000 with equipment. A. V. Teisen Co., 4804 North Kedzie Avenue, is architect.

Englander Spring Bed Co., 3943 Lowe Street, Chicago, is planning to rebuild part of plant recently destroyed by fire. Headquarters are at Johnson and Stewart Avenues, Brooklyn, N. Y.

Electric Household Utilities Corporation, West Twenty-second Street and South Fifty-fourth Avenue, Cicero, Ill., has begun construction of one-story foundry, to cost more than $50,000 with equipment. Present foundry at Waukegan, Ill., will be removed to new building early in September, with installation of additional equipment.

Half interest in Chamberlain Machine Works, Waterloo, Iowa, manufacturer of clothes wringers, has been sold to Studebaker Securities Co. Company has been reorganized as Chamberlain Corporation and plans are under way for a new factory, 100 x 200 ft., with another unit, 150 x 300 ft., contemplated for next spring. F. L. Chamberlain, who has been head, remains as president; Col. George M. Studebaker is treasurer, and C. M. Sherrill, secretary.

International Harvester Co., Chicago, has plans for a new plant, 230 x 620 ft., and a two-story addition to its recently completed motor manufacturing unit at its Farmall tractor plant at Rock Island, Ill., entire project to cost about $1,000,000.

Milwaukee

MILWAUKEE, July 15.—Machine tool manufacturers still are far behind on deliveries, but there is a general feeling that the peak has been passed. Inquiries from railroads are increasing. Orders from automotive manufacturers have not receded and demand from other sources continues good, although there are signs of relaxation in some quarters.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., maker of drilling and milling machines, horizontal boring machines, etc., has contracted with Immel Construction Co., Fond du Lac, for one-story addition to machine shop, 90 x 250 ft., to cost $100,000 including equipment. Austin Co., Cleveland, is engineer.

University of Wisconsin, Madison, will close bids Aug. 6 for the construction of the mechanical engineering building for which $577,000 has been appropriated. Building will be irregular in shape, 230 x 250 ft., three stories. Bids are to be sent to J. D. Phillips, business manager of university. Plans are by Arthur Peabody, State architect.

Central Brass Foundry Co., Neenah, Wis., recently organized by A. M. Schnetzer, superintendent of Neenah Brass Works for fifteen years, and John W. Hewitt, one of owners of Hewitt Machine Co., Neenah, will open a new foundry at Menasha, Wis., specializing largely in jobbing work on paper and sulphite mill machinery. Mr. Schnetzer has disposed of his interest in the Neenah Brass Works, and will be in active charge of the new company.

Rock County Clerk, Janesville, Wis., will take bids until July 20 for construction of a machine shop, garage and warehouse, 50 x 200 ft., for servicing and

storing road-making and maintenance equipment. Charles E. Moore is County highway commissioner.

Milwaukee Electric Railway & Light Co., 217 Michigan Street, Milwaukee, has started excavation for addition to Cold Spring Avenue car repair and service shop, 164 x 292 ft., to cost $100,000. R. H. Pinkley is in charge.

Acme Metal & Scrap Iron Co., 497 Virginia Street, Milwaukee, will build a plant and refinery addition, 45 x 110 ft.

Cincinnati

CINCINNATI, July 15.—Fresh bookings for machine tools declined the past week, but manufacturers report sufficient unfilled orders to maintain production at a good rate throughout the summer. Demand is chiefly for standard tools and is coming from a wide source, which tends to offset the decrease caused by the withdrawal of automobile manufacturers from the market pending development of new models. The Chicago, Burlington & Quincy Railroad has placed an order with a local manufacturer for four motor-driven lathes.

Foreign business has declined sharply, although interest was revived last week when several machine tool makers received requests from a Russian commission, which had been in this market for several months, for additional information.

Plans are under way by Emery Industries, Inc., June and Long Streets, Ivorydale, Cincinnati, for one-story power plant, to use pulverized fuel, to cost over $75,000 with equipment. Kinney & Ehlers, Inc., Dixie Terminal Building, is consulting engineer.

C. O. Sherrill, City Hall, Cincinnati, city manager, has awarded general contract to William Miller & Son, 1952 Central Parkway, for hangar at municipal Lunken Airport, with shop and repair facilities, to cost $61,000. Kruckemeyer & Strong, St. Paul Building, are architects.

Board of Education, Sidney, Ohio, is said to be planning installation of manual training equipment in two-story high school addition to cost $250,000, for which plans will be drawn by H. L. Loudenback & Son, Kah Building, architects.

City Council, Murfreesboro, Tenn., plans installation of elevated steel tank and tower, with capacity of about 500,000 gal., in connection with extensions and improvements in municipal waterworks to cost $300,000, for which bonds have been approved. J. B. Farmer is superintendent in charge.

Absopure Refrigerator Corporation, Louisville, recently formed by David A. Brown, Louisville, and associates, has taken over Vogt Refrigerator Co., with local plant, manufacturer of metal refrigerators and equipment, and Absopure Refrigerator Co., Detroit, manufacturer of electric refrigerating units and accessories, and will consolidate. Output will be increased. Both companies were formerly operated as divisions of General Necessities Corporation, 2011 Park Avenue, Detroit. Mr. Brown will be president of consolidated company.

Formica Insulation Co., 4614 Spring Grove Avenue, Cincinnati, manufacturer of laminated insulating products, has taken out a permit for multi-story addition, to cost $100,000 with equipment, for which general contract recently was let to Ferro Concrete Construction Co., Third and Elm Streets.

Board of Education, Delaware, Ohio, is said to be planning installation of manual training equipment in two-story high school to cost about $500,000, for which bids are being asked on general contract until July 25. Glass-Ramsey, Inc., 186 East Broad Street, Columbus, Ohio, is architect.

Girdler Corporation, Goss Avenue and Shelby Street, Louisville, recently organized to take over and consolidate local group of companies manufacturing ice cream freezers, freezing machinery, etc., will make extensions and improvements in four-story factory at location noted. Plans are also under way for a new unit, to cost more than $50,000 with equipment. Walter H. Girdler is president.

Indiana

INDIANAPOLIS, July 15.—Contract has been let by Board of Trustees, Purdue University, Lafayette, to Glenn W. North Construction Co., Terre Haute, for first unit of mechanical engineering building at West Lafayette, to cost $150,000 with equipment. Walter Scholer, Painters' and Decorators' Building, Lafayette, is architect.

Grapho-Metal Packing Co., 2232 Alvord Street, Indianapolis, manufacturer of metallic packing, has purchased plant and business of Detroit Replacement Service Inc., 2559 Bellevue Street, Detroit, manufacturer of water pumps, starting cranks and kindred products, and will consolidate. Detroit plant will be removed to Indianapolis where expansion will be carried out. Albert D. Smith is president.

George B. Limbert & Co., 570 Fulton Street, Chicago, manufacturers of iron pipe, steamfitters' supplies and kindred products, have awarded general contract to H. B. Olney, 1200 East Chicago Avenue, East Chicago, Ind., for extensions and improvements in branch plant at East Chicago, to cost about $35,000. Briggs & Almy, 608 South Dearborn Street, Chicago, are engineers.

Automatic Screw Products Corporation, Indianapolis, recently organized by A. J. Vondersaar, 2021 Hoyt Avenue, and associates, has leased 10,000 sq. ft. in building at Nineteenth Street and Martindale Avenue, and will establish plant for second operation work on screw machine products.

Citizens' Gas Co., 47 South Penn Avenue, Indianapolis, is planning extensions and improvements in artificial gas plant, including installation of gas compressor units and auxiliaries, ovens and by-products equipment, and other machinery, to cost about $800,000.

Cleveland

CLEVELAND, July 15.—Machine tool sales by dealers were rather light the past week and not much new inquiry developed. The Packard Motor Car Co., Detroit, purchased a few tools to manufacture Diesel engines for airplanes and has a number of additional machines on its list of requirements. Another Michigan automobile manufacturer is figuring on some additional equipment. Sales by a local manufacturer of lathes continue good, its business so far this month equaling that during the same period in June. This company reports a good foreign demand from England and France. While machine tool deliveries are easier, the improvement on most lines is only slight.

Contract has been let by Cleveland Institute of Aviation, Society for Savings Building, Cleveland, to Gilchrist Construction Co., Western Reserve Building, for hangar, 120 x 145 ft., with repair facilities, and building, 40 x 120 ft., at proposed airport and training field, to cost $80,000 with equipment.

William R. Hopkins, City Hall, Cleveland, city manager, has plans for one-story municipal automobile service, repair and garage building, to cost about $100,000 with equipment. Herman Kregelius, City Hall, is city architect in charge.

Standard Oil Co., Toledo, Ohio, plans rebuilding part of oil storage and distributing plant destroyed by fire July 4.

Ohio Piston Co., 5337 St. Clair Avenue, Cleveland, has plans for one-story addition, to cost about $50,000 with equipment. Kalsch & Hoefler, 4500 Euclid Avenue, are architects.

Rainbow Luminous Products, Inc., operating Rainbow Light, Inc., 21-43 Forty-fourth Road, Long Island City, manufacturer of electric tube lighting equipment, has purchased Central Outdoor Advertising Co., 1124 Carnegie Avenue, Cleveland, recently formed by merger of General Outdoor Advertising Co., address noted, and Harry H. Packer Co., 2420 West Superior Street, same city, manufacturer of electric signs, displays, etc. Purchasing company will consolidate into single operating unit, and plans expansion. George L. Johnson is chairman of board of Rainbow organization.

Cleveland Chain & Mfg. Co., Pennsylvania Railroad and Henry Street, Cleveland, manufacturer of steel chains, chain hooks, etc., has plans for one-story addition, 45 x 100 ft., to cost about $50,000 with equipment.

Piqua Electric Mfg. Co., Piqua, Ohio, has been incorporated, and has engaged in manufacture of electric fans, especially for exhaust and ventilating purposes. Company is contemplating building a new plant within the next year.

Gulf States

BIRMINGHAM, July 15.—Expansion will be carried out at Dallas, Tex., by Fairchild Aviation Corporation, 270 West Thirty-eighth Street, New York. A new hangar with shop and repair facilities will be constructed at Love Field, and other units established, to cost $75,000 with equipment. Stanley Moir is local manager.

Southern Sugar Co., Clewiston, Fla., has work under way on expansion program, to include installation of conveying, grinding and other equipment, to cost more than $600,000. Work is scheduled for completion in December. W. G. Ames is company construction engineer in charge. Headquarters are at 645 North Michigan Avenue, Chicago. B. G. Dahlberg is president.

Bent Concrete Pipe Co., Forth Worth, Tex., manufacturer of large diameter steel-reinforced concrete pipe, with headquarters in Grosse Building, Los Angeles, has acquired 10-acre tract at West Dallas, Tex., as site for new plant, to cost over $700,000 with machinery.

Uniheart Universal Tool Co., Muscle Shoals City, near Sheffield, Ala., recently organized, has established a local plant to manufacture a patented tool holder, with drop forging, finishing and other departments.

John Deere & Co., Moline, Ill., manufacturer of plows and other agricultural machinery, has asked bids on general contract for a three-story and basement factory branch and distributing plant, 116 x 120 ft., at San Antonio, Tex., to cost over $75,000 with equipment. O. E. Eckerman, Moline, is architect. Clark E. Inglish, 311 South Flores Street, San Antonio, is local manager.

R. W. Alfred, 120 West Craig Street, San Antonio, Tex., and associates are planning new ice-manufacturing plant at Mercedes, Tex., to cost about $85,000 with equipment.

Tobian Garage, Inc., Dallas, Tex., has purchased four-story building and will remodel for new service, repair and garage building, to cost $150,000, exclusive of puchase price. Company is operated by William Tobian.

Board of Education, Birmingham, has authorized installation of manual training shops in first unit of new West End high school, to cost more than $400,000 with equipment. Plans have also been approved for two-story unit at industrial high school for negroes. Warren, Knight & Davis, Protective Life Building, are architects.

St. Louis

ST. LOUIS, July 15.—Plans are being considered by Prest-o-Lite Co., 30 East Forty-second Street, New York, manufacturer of acetylene equipment, welding apparatus, etc., for branch plant at Oklahoma City, Okla., consisting of two one-story units, 60 x 131 ft., and 50 x 60 ft., to cost about $100,000 with equipment.

Terminal Railroad Association, 1800 Market Street, St. Louis, has filed plans for one-story shop and equipment storage building, 45 x 175 ft., to cost about $55,000 with equipment.

Schmidt, Boucher & Overend, Brown Building, Wichita, Kan., architects, have awarded general contract to Blaser-Vollmer, Inc., 430 North Rock Island Avenue, for three-story and basement automobile service, repair and garage building, 74 x 145 ft., to cost about $100,000 with equipment.

Pierce Petroleum Corporation, 1329 Gratiot Street, St. Louis, has awarded general contract to Fruin-Colnon Contracting Co., Merchants Laclede Building, for one-story storage and distributing plant, 70 x 119 ft., to cost about $45,000 with equipment. H. L. Denning is company architect, address noted.

National Supply Co., 9 South Main Street, Tulsa, Okla., oil and gas well equipment and supplies, has awarded general contract to W. H. Horster, Exchange National Bank Building, for three-story storage and distributing plant, with pipe and fitting departments, etc., 75 x 125 ft., to cost about $75,000 with equipment. A. M. Atkinson, Mid-Continent Building, is architect.

New Era Motors, Inc., care of J. E. Roberts, 17 East Forty-fifth Street, New York, recently organized to manufacture an eight-cylinder front drive automobile, to be known as Ruxton automobile, has leased property at St. Louis for temporary plant pending construction of a new plant at Detroit. Both parts production and assembling departments will be provided. A. M. Andrews is president; and Fred D. Peabody, formerly assistant sales manager of Hupp Motor Car Corporation, Detroit, sales manager.

Sparton Aircraft Co., Tulsa, Okla., has work under way on an expansion program for production of cabin aircraft, airmail transport and training airplanes. Company is a subsidiary of Skelly Oil Co., Tulsa.

Pacific Coast

SAN FRANCISCO, July 11.—American Foundry Co., Bay Point (Contra Costa County), Cal., has purchased plant property of Dow Pump & Diesel Engine Co., Alameda, Cal., and will remove to that location, with installation of additional equipment. A. Searle is general manager.

Bates Valve Bag Co., 2001 East Fifty-seventh Street, Los Angeles, has plans for one-story plant, 170 x 360 ft., to cost over $100,000 with machinery. Austin Co. of California, Inc., is engineer. Headquarters are at 35 East Wacker Drive, Chicago.

Cudahy Packing Co., 803 Macy Street, Los Angeles, has awarded general contract to Pozzo Construction Co., 421 Macy Street, for three additions to meat-packing plant, to cost more than $100,000 with equipment; a three-story unit will be built for lard refining. Company engineering department, Omaha, Neb., is in charge.

Oil Well Mfg. Co., 6040 Alameda Street, Huntington Park, Cal., manufacturer of oil well equipment and supplies, has plans for a one-story addition, 70 x 140 ft., including improvements in present plant, to cost over $40,000 with equipment. A. Godfrey Bailey, Hillcrest Building, is architect.

Utah Power & Light Co., Kearns Building, Salt Lake City, has plans for a two-story addition to steam-operated electric power plant, to cost $250,000 with equipment. Company is operated under direction of Electric Bond & Share Co., 2 Rector Street, New York.

Jessie J. Ward, city clerk, Centralia, Wash., will receive bids until Aug. 13 for equipment for a municipal electric light and power plant, including two 2900-hp. hydraulic turbines; two 2500-kva. electric generators; eight 1667-kva. transformers, and auxiliary equipment.

Aircraft Plywood Corporation, Seattle, recently organized, has acquired former local plant of Gould Lumber Co. for new works. Expansion will be carried out to provide for production of 200,000 ft. plywood per day for aircraft industry. Company is said to be arranging sale of stock issue under direction of First Securities Co., Seattle, part of fund to be used for purpose noted.

Pacific Mill & Mine Supply Co., 1122 Santa Fe Avenue, Los Angeles, has awarded general contract to John M. Cooper Co., Inc., Rives-Strong Building, for one-story storage and distributing plant, 40 x 160 ft., to cost about $30,000 with equipment.

Canada

TORONTO, July 15.—While there has been a falling off in machine tool sales in this market, local builders and dealers look upon the decline as seasonal, rather than as an indication of a recession in business. Current demand, while below that of a couple of months ago, is on a more substantial basis than for the corresponding period last year. Inquiries for single tools are in fairly good volume. Small tools are moving freely.

R. S. Hart, manager of National Steel Car Co., Hamilton, Ont., has acquired plant formerly occupied by Carbon & Alloy Steels, Ltd., Welland, Ont., and has awarded contract to Gardner Construction Co., for remodeling. A new company, to be known as National Steels, Ltd., will operate works.

Lionite Abrasive Co., subsidiary of General Abrasive Co., Niagara Falls, N. Y., will start work at once on erection of a plant in Stamford township, near Niagara Falls, Ont., to cost $150,000.

An agreement between Simcoe, Ont., Board of Education and American Can Co., has been approved by Town Council, whereby former Central school property passes to can company for $35,000. This is understood to be initial step in establishing a can manufacturing plant to ultimately cost $1,000,000.

Bids are being received by W. A. Pearse, business administrator of Board of Education, 155 College Street, Toronto, for lathes and other machinery for installation in Western Branch, Technical High School.

Guelph Stove Co., Guelph, Ont., has taken out a permit for an addition, to cost $115,000.

Auto Strop Safety Razor Co., 83 Duke Street, Toronto, will build an addition to cost $50,000.

City of Hull, Que., will spend $100,000 on construction of waterworks plant, including purchase of pumping units, etc. Leo Lancetot, City Hall, is engineer.

Canadian Oil Companies, Ltd., 2 Strachan Avenue, Toronto, contemplates building an addition and erection of new storage tanks at Petrolia, Ont.

Toronto, Hamilton & Buffalo Railway Co., has awarded several contracts for roundhouse repair shops at Hamilton, Ont., to cost $850,000.

Robert Mitchell Co., 750 Belaire Street, St. Laurent, Que., has awarded contract to Anglin-Norcross, Ltd., 2063 Victoria Avenue, Montreal, for a foundry to cost $500,000. T. Pringle & Sons, Ltd., 410 St. Nicholas Street, Montreal, is architect.

Jeffrey Mfg. Co., 1111 Beaver Hall Hill, Montreal, has awarded general contract to A. F. Byers & Co., Ltd., for a factory at Ville La Salle, Que.

Foreign

OFFICIALS of Petroleum Heat & Power Co., 511 Fifth Avenue, New York, manufacturer of oil burners and oil-burning equipment, are planning organization of subsidiary to operate in France. It is proposed to establish a plant in that country for complete distributing and servicing facilities. Project is reported to cost over $1,000,000. William C. McTarnahan, president, has gone abroad to complete details.

Government of Russia, through Amtorg Trading Corporation, 261 Fifth Avenue, New York, official buying agency for Soviet Russian Government, has arranged with Lockwood Greene Engineers, Inc., 1 Pershing Square, New York, and Boston, architect and engineer, to reorganize and reconstruct textile mills in Soviet Union, including design and construction of new plants covering all branches of production. A five-year program has been ratified, providing a capital investment of about $700,000,000 for textile industry during that period, and which is estimated will more than double present output. Announcement has been made by both interests noted that a large part of machinery and equipment requirements will be purchased in United States.

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THE IRON AGE

ESTABLISHED 1855

Member of
Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published Every Thursday by the

IRON AGE PUBLISHING CO.

239 West Thirty-ninth Street, New York

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Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred C. Stevens, *Secy. and Treas.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: 811 Park Building. Boston: Room 230, 80 Federal St. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Avenue. Cincinnati: 409 Traction Building. Buffalo: 616 Ellicott Square. Washington: 536 Investment Building. San Francisco: 703 Market Street.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

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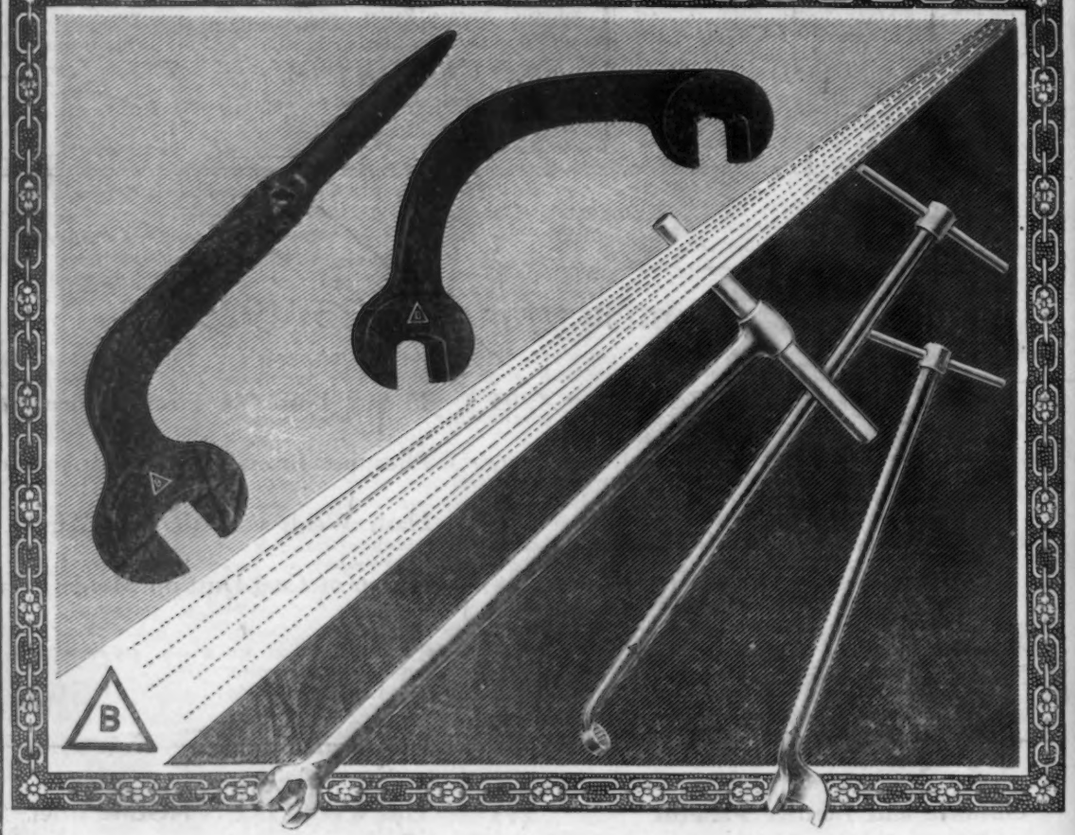
DROP FORGINGS

MACHINERY

HAND TOOLS



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